NETWORK WORLD

The Newsweekly of User Networking Strategies

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Novell bows to users on Named Pipes

By Laura DiDio
Senior Editor

Facing pressure from users, Novell, Inc. did an about-face last week and promised to deliver Named Pipes for DOS software before year end.

In an interview last month, Darrell Miller, executive vice-president of Novell's software group, said Named Pipes for DOS was "on the back burner due to lack of user demand" ("Top Novell execs discuss strategy," *NW*, Jan. 22). He said only two major users had requested the product, adding, "We won't do it unless we see significant user demand."

But users were quick to react, calling Novell and *Network World* to express their need for Named Pipes for DOS. That user demand was also very much in evidence at the Networld '90 trade show in Boston earlier this month, Miller admitted.

"Based on recent end-user feedback, we've put Named Pipes for DOS back on the front burner and we'll deliver it as soon as possible," Miller said.

Among other functions, the product would enable DOS workstations on a NetWare local-area network to communicate with Microsoft Corp.'s SQL Server, running on a dedicated OS/2 workstation, using the Named Pipes

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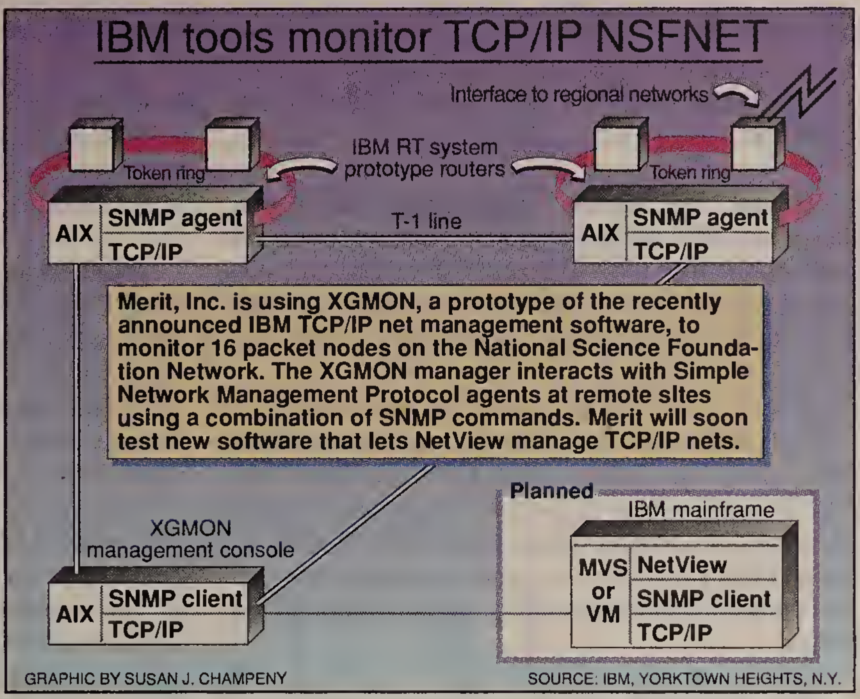

Merit, Inc. is using XGMON, a prototype of the recently announced IBM TCP/IP net management software, to monitor 16 packet nodes on the National Science Foundation Network. The XGMON manager interacts with Simple Network Management Protocol agents at remote sltes using a combination of SNMP commands. Merit will soon test new software that lets NetView manage TCP/IP nets.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: IBM, YORKTOWN HEIGHTS, N.Y.

Prototype of IBM TCP/IP mgmt. tool trialed at Merit

XGMON system enables consortium to manage 16-node T-1 network of IBM switches, routers.

By Paul Desmond
Senior Writer

ANN ARBOR, Mich. — Merit, Inc. is using a prototype version of a recently announced IBM TCP/IP net management product to manage the National Science Foundation Network (NSFNET).

The system, dubbed XGMON, uses the Simple Network Management Protocol (SNMP) to manage a collection of prototype IBM routers and packet switches used as backbone nodes in NSFNET. SNMP is the Transmission Control Protocol/Internet Protocol network management standard.

XGMON is capable of managing any device that supports SNMP, whether it be on the backbone or a regional network supported by NSFNET. For example, Merit uses XGMON to manage regional network routers from cisco Systems, Inc. and Proteon, Inc.

Merit is also preparing to test prototype IBM software that will give NetView native support for SNMP. That software will make it possible for NetView to manage Systems Network Architecture nets and devices on TCP/IP networks that support SNMP.

IBM announced that capability

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FCC weighs plan to ease rules on AT&T

AT&T-sponsored proposal would free carrier from filing tariffs for custom net arrangements.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — The FCC is considering a plan to end regulatory oversight of AT&T's custom network arrangements, freeing the carrier to offer such deals through private contracts rather than public tariffs, *Network World* has learned.

The plan, which would cover services currently offered under Tariffs 12, 15 and 16, was formulated by AT&T and may be included in a proposed Federal Communications Commission rule making to be discussed at a scheduled March 8 public hearing.

The rule making is expected to outline changes being considered by the FCC for regulating AT&T in light of growing competition in the interexchange market.

William Catucci, corporate vice-president of federal regulatory affairs at AT&T, said the carrier has discussed a plan with FCC officials that would reclassify offerings targeted to large users as non-common carrier services. Currently, all AT&T services are classified as common carrier services, meaning they must be available to all customers under uniform terms and conditions.

Categorizing custom network arrangements as non-common carrier services would enable AT&T to offer them without filing for FCC approval.

"We're hoping that the commission will put this [idea] in their proposed rule making as a possible way of treating competi-

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Trends and TECHNOLOGIES RESHAPING networks!

Is there no way to satisfy bandwidth hunger? Page 36.

User builds LAN-based image tool

By Paul Desmond
Senior Writer

QUINCY, Mass. — A mutual fund service company here has built a LAN-based imaging application, based on a prerelease version of IBM's ImagePlus software, that is expected to support the distribution of some 100,000 documents daily by year end.

Boston Financial Data Services, Inc. (BFDS) is using the IBM Application System/400 version of ImagePlus to support its Automated Work Distributor, a work-flow automation system that is expected to boost employee productivity between 30% and 40%.

BFDS maintains mutual fund shareholder accounts — including handling customer inquiries and generating account statements — for 93 mutual fund management companies.

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FBI PROBE OF US SPRINT threatens the implementation of the FTS 2000 network. Page 2.

INNOVATE VS. AUTOMATE, the secret to gaining a competitive advantage. Page 2.

HOSPITALS EXAMINE the merits of HL7 at an annual health care meeting. Page 2.

US SPRINT PROPOSES rate revisions for its Network WATS and Ultra WATS plans. Page 6.

ISDN PROVES ITS WORTH in production use, living up to trial expectations. Page 6.

SUN'S NFS EXHIBITION shows a wide range of industry support for the network protocol. Page 6.

NEWSPAPER

FEATURE

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Today's matrix switches blur product boundaries

By David Levin
Special to Network World

Once used primarily for bulk port switching among front-end processors, matrix switches today offer extensive network management, T-1 multiplexing and T-1 cross-connection capabilities. These additional features make the matrix switch worthy of a fresh look by network managers.

As the functionality of matrix switches has grown and changed, so has the market. According to a recently completed market survey by New York-based consulting and systems integration firm Netcomm, Inc., three vendors lead this market: Bytex Corp., Data Switch Corp. and Telenex Corp. Next come Codex Corp., Datacomm Management Sciences, Inc., Datatran Corp., Dynatech Corp. and Racal-Milgo, which resells Telenex's switch.

Data Switch recently caused a stir within the industry by announcing the Liberator, a fiber satellite unit that con-

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Gov't users worried over FBI probe of US Sprint acts

Users hope investigation won't delay FTS 2000.

By Bob Brown
Senior Editor

WASHINGTON, D.C. — Users at some federal agencies last week expressed concern that an FBI probe into US Sprint Communications Co.'s Federal Telecommunications System (FTS) 2000 award could delay implementation of the $25 billion network.

Some observers said that if Federal Bureau of Investigation findings substantiate the lawsuit's allegations, the General Services Administration could be forced to nullify the award and put it back out for bid. Most, however, doubt that such drastic measures would be instituted.

A US Sprint spokeswoman acknowledged that the FBI is conducting an investigation into whether the carrier illegally obtained information from other bidders to help it win part of the FTS 2000 contract.

The FBI probe, which is reportedly focusing on outside consultants hired by the carrier, is the result of a civil suit brought by two former employees of US Sprint who alleged that the carrier spied on rivals to help it win 40% of the FTS 2000 contract.

The FBI first contacted US

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Innovation is the key to making IS spending pay

By Wayne Eckerson
and Joe Panepinto
Network World Staff

While users invest millions of dollars in information systems (IS), most fail to achieve any competitive advantage because they apply information technology to automate existing operations rather than to develop innovative applications.

Automation can provide benefits such as lower costs and increased productivity. But the real competitive advantages come from innovation — using technology to provide services or products that rivals don't offer.

To foster innovation, some companies are distributing IS functions such as applications development to individual business units, bringing technology people closer to the front lines and getting them attuned to end-user needs. Some users are even outsourcing IS functions in order to focus their attention on developing strategic applications.

Other businesses have adopted award programs and brainstorming sessions in which technical and nontechnical employees hash out ideas for innovation.

"Most companies are using communications merely to accelerate existing procedures," said Walter Ulrich, a consultant at Arthur D. Little, Inc. in Cambridge, Mass. "A select few are using communications to change work flows and procedures to better serve business needs."

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Conference-goers debate pros, cons of HL7 protocol

Benefits of open systems may outweigh hospitals becoming heavily involved in networked systems.

By Wayne Eckerson
Senior Writer

NEW ORLEANS — The debate over open systems and the emerging Health Level 7 (HL7) protocol standard took center stage last week at the health care industry's annual information and management systems conference and exhibition here.

An overflow crowd of more than 300 people attended a conference session here to listen to a panel of five experts debate the pros and cons of HL7. One of the most popular exhibits was a seven-vendor HL7 demonstration (see "HL7 demo watchers impressed, skeptical," page 56).

Proponents of the emerging HL7 standard, which specifies a standard application interface to different lower level network protocols, said the standard makes it easier for hospitals to interconnect multiple vendors' medical systems.

This makes it possible for hospitals to give departments the freedom to select systems that best fit their needs, instead of dictating the systems they must use.

But critics of HL7 said adoption of the standard requires hospitals to get too heavily involved in the design and maintenance of networks, a task that is best left to

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Briefs

OSI wares to bow. NCR Comten is expected to announce Open Systems Interconnection software for its Comten 56X5 family of front-end processors next week in conjunction with the Interface show in Dallas.

NCR Comten had previously announced support for Transmission Control Protocol/Internet Protocol networks on its IBM Systems Network Architecture-compatible front ends, meaning TCP/IP and OSI protocols can now share an SNA backbone, analysts said.

Rolm to close customer centers. Rolm, an IBM and Siemens AG company, last week said it will close more than half of its nine U.S. customer service centers and has reassigned customers in its Southwest sales and support region into neighboring territories.

As part of an ongoing program to cut costs, on April 1, Rolm will close service centers in Atlanta, Ben Salem, Pa., Dallas, Irvine, Calif., and New York. The four remaining centers are in Boston, Rolling Meadows, Ill., Santa Clara, Calif., and Vienna, Va. Employees at the five customer service centers will be offered jobs in other areas, such as sales, within Rolm.

US Sprint lands data deals. US Sprint Communications Co. last week said it has landed four data network and electronic mail contracts valued at $23.2 million.

Under a contract valued at $17 million, the carrier will build a private data network linking 370 ITT Corp. Sheraton Hotels in the U.S. and Canada. The company will also provide a $3.6 million public fiber-optic electronic messaging system to Guatemalteca de Telecommunicaciones (Guatel), Guatemala's national telecommunications administration, and install a similar $1.8 million SprintMail system for the Brazilian Embratel International Text and Data Department.

Finally, the company said it will install $800,000 worth of Sprint Data Group packet switches for use by the Ministry of Correctional Services in Canada.

DEC to enter DBMS derby. Digital Equipment Corp. will announce this week a distributed data base management system based on enhanced versions of its VMS operating system and its Rdb/VMS relational DBMS. DEC will also announce its first fault-tolerant VAX minicomputer that will support on-line transaction processing (OLTP).

Together, the products will position DEC to compete against IBM, Stratus Computer, Inc. and Tandem Computers, Inc. in the OLTP market.

The enhanced versions of VMS and Rdb/VMS will support a two-phase commit protocol, which enables users at one site to access data from both local and remote data bases with a single data base query. The two-phase commit protocol ensures that changes made to the data are reflected in each data base.

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161 Worcester Road
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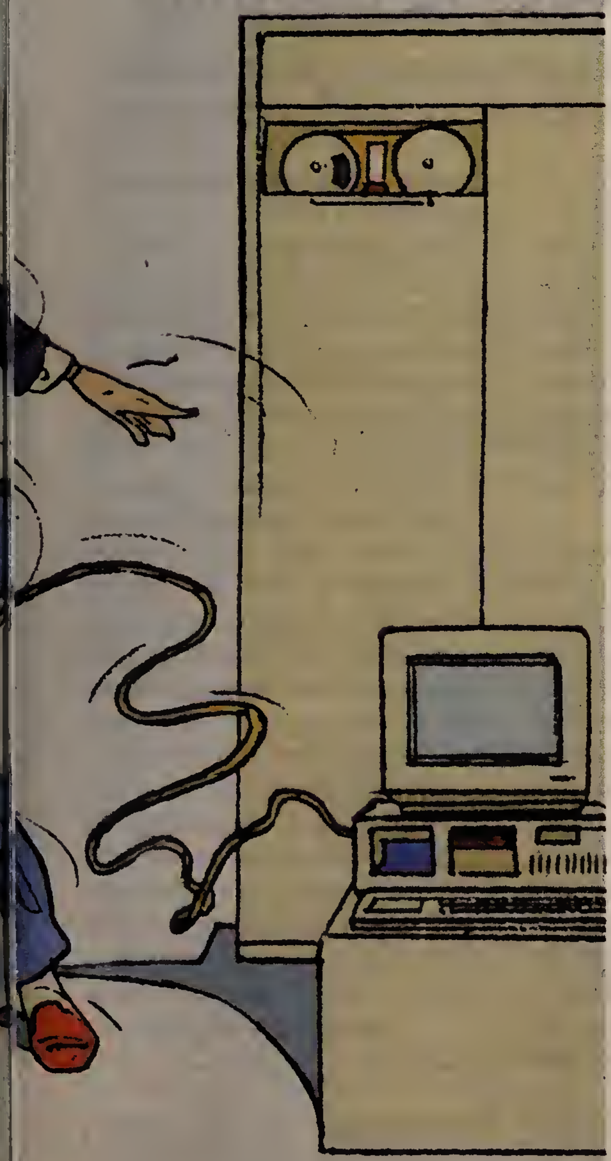
As Global Competition Systems Must Change To

Intensifies, Information A Competitive Weapon.



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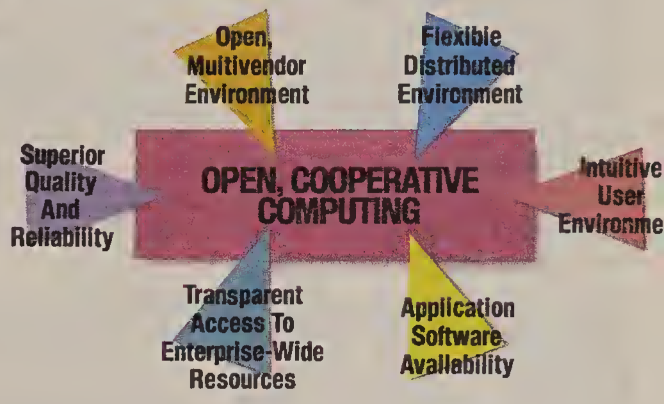
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X/Window System expert discusses use of technology

MIT Principal Research Scientist Bob Scheifler details X/Windows' functionality and adaptability.

The MIT X/Window Consortium recently entered the final year of its three-year charter to develop specifications for X/Window System interfaces. It is currently negotiating with its 70-plus members to renew for another two years.

The consortium was founded Jan. 1, 1988, when the Massachusetts Institute of Technology attempted to turn the windowing system technology over to the vendor community that helped fund its development. Vendors, however, wanted to keep its fate in the hands of a neutral party.

Bob Scheifler, a principal research scientist at MIT's Laboratory for Computer Science, director of the MIT X/Window Consortium and the chief architect of the X/Window System protocol, met recently with Network World *New Products Editor Tom Smith to discuss X/Window System and the ways it can benefit users.*

In terms of functionality, is it fair to say that X/Window System terminals generate the display and leave the application processing to a separate back-end processor somewhere on a network?

X terminals have a screen, a keyboard and mouse, a processor and some memory, and they are running one task: the X server.

Think of the X server as a dedicated application that happens to own the screen while other applications talk to it; it is a dedicated program driving the keyboard, mouse and display.

Think of an ASCII terminal and add graphics and windowing to it. It's still just a terminal; that's all it does. You don't run programs on it.

Now I have an application, and in order to get the user interface part of its task done, it's going to communicate with this X server.

The application generates streams of requests across the network, and X server is pulling them off the wire and executing them. It says 'create a window,' and I'll create a window.

Is the application the client of the X server?

Yes. In our terminology, it's the client. The terminology is confusing. When we say server vs. client, we get about 50% of the people confused.

What's the benefit of moving the generation of the end-user interface out to the desktop?

One benefit is that you isolate that functionality. Every year, a new workstation comes out; typically, you have to upgrade your whole system. This allows you to segregate that. You can keep your display technology and upgrade processor technology as often as needed.

Is X/Windows only for Unix?

It is very much centered in the Unix environment, and all of our efforts have been focused on Unix-based platforms, but the programming interfaces are designed to be operating system-independent.

DEC sells X on its VMS line. IBM is selling it on its VM systems. There's no reason why it can't run in the OS/2 environment. We just don't know of anybody who has brought out products in that arena yet. It doesn't really run in the DOS environment because it requires a multitasking operating system.

Given that the various implementations of X/Windows — such as the Open Software Foundation's Motif and Unix International, Inc.'s Open/Look — have a different look and feel but are based on the same foundation, is it possible to use a single X/Window terminal to access different X environments?

Nothing prevents me from running both of those. One will look like Open/Look, and one will look like Motif, and I may get confused by visual differences or the way they do menus differently. For example, both Motif and Open/Look have a close button. In one, it means 'turn this into an icon' and in the other, it means 'terminate the application.' But other differences are not that major. I mention that because it's the worst example we know of.

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Production use of ISDN lives up to expectations

American Transtech saving on line, labor costs.

By Tom Smith
New Products Editor

JACKSONVILLE, Fla. — American Transtech's use of ISDN services in a production environment has validated the cost savings and other expectations the company predicted in an early trial of the technology.

Use of Integrated Services Digital Network services has saved the company long-distance charges and labor costs, increased the number of calls it can support with existing trunks and improved the accuracy of its telephone operators.

American Transtech, which provides telemarketing, financial management and direct mail services, began a small-scale ISDN trial in 1987 involving eight telemarketing agents, according to Nancy Brown, telecommunications manager at the company here. The trial used ISDN's dialed number identification service (DNIS) and automatic number identification (ANI) features.

Based on trial results, the company projected that use of ISDN in a production environment would save 3.6 cents per call because operators could handle calls more quickly, thereby lowering long-distance charges. The company also anticipated that the combined labor savings of all the operators would total half of one worker's week because each agent could handle more calls.

The test persuaded the company to adopt ISDN, and by 1989, it was using ISDN Primary Rate Interface lines to support 15% of the three million incoming calls the company handled that year.

The number of calls delivered over the ISDN links with ANI — which makes it possible to pass the call to an agent and simultaneously display the caller's phone number — varied from 60% to 95%, depending on the

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Sun NFS demonstration shows sweeping support

Wares from 70 vendors communicate; now the next task is to develop distributed applications.

By Susan Breidenbach
West Coast Bureau Chief

SAN MATEO, Calif. — Sun Microsystems, Inc.'s fifth annual interoperability show, Connectathon '90, here last week linked products from 72 vendors in what Sun is calling the world's largest demonstration to date of applied networking among heterogeneous systems.

Connectathon '90 served to test interoperability among 78 different implementations of Sun's Network File System (NFS), and it did the same for 56 implementations of the X/Window System. This resulted in about 4,000 pairings, or nearly double the 2,200 interoperability tests completed at Connectathon '89.

The extra load on the Connectathon network was accommodated in part by enhancing the test floor's traditional Ethernet with a Fiber Distributed Data Interface (FDDI) backbone that tied 10 Ethernet subnets. Also new this year were the interoperability tests of several X/Window applications and an NFS module for Novell, Inc.'s NetWare.

"We hear a lot about interoperability among heterogeneous systems, but the bottom line is that NFS is the only network protocol that has become popular on platforms ranging from laptops to supercomputers," said Bill Keating, director of technology marketing at Sun.

Systems involved in the demonstration included laptop and desktop computers, Unix workstations and superservers, minicomputers and mainframes running proprietary operating systems, and a remote Cray Research, Inc. supercomputer.

NFS, which has been licensed by about 290 organizations worldwide, is now an integral part of commercial systems from more than 90 vendors. It provides users with transparent access to files stored on dissimilar systems on a Transmission Control Protocol/Internet Protocol network, making those files appear local to the user machines.

For example, a user on a personal computer running a DOS implementation can view files stored on an NFS host as an addi-

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Correction: In the videoconferencing Buyer's Guide ("Videoconferencing will fast forward in 1990," *NW,* Jan. 29), the article should have stated that Compression Labs, Inc. shipped more units than any other vendor *until* the first half of 1989, not *during* the first half of that year.

US Sprint readies to drop rates for two WATS plans

By Bob Wallace
Senior Editor

KANSAS CITY, Mo. — US Sprint Communications Co. last week proposed rate revisions for Network WATS and Ultra WATS, its multilocation WATS discount plan and high-end banded WATS service, respectively.

Under the proposed changes, scheduled to take effect March 1, US Sprint would lower its Network WATS monthly fees and waive them altogether for high-end users. It would also discount Ultra WATS service 20% for customers that agree to use the service for two years.

Under the current Network WATS billing plan, users pay a $1,250 monthly enrollment fee for US Sprint's Dial 1 WATS, Ultra WATS and FON calling card, and receive a 15% discount on usage charges amassed by all three services.

Under the proposed changes, the $1,250 fee will be lowered to $1,000 and waived altogether for customers that commit to spending $15,000 per month on the combined US Sprint services, according to Steven Faulkner, product manager for the carrier's WATS services.

The carrier also announced the Network WATS Term Plan, an option that provides users with a 20% discount on Ultra WATS in return for a two-year contract commitment.

The option, the first multiyear arrangement offered with Ultra WATS, is available on a per-site basis.

Customers that can't meet the $15,000 monthly commitment for Network WATS can reduce the monthly service fee to $600 if they have at least one Ultra WATS site enrolled in the Term Plan.

Long-term arrangements

"It's long been US Sprint's pricing strategy not to lock users into long-term contracts," Faulkner said. "But based on customer input, we realized there is a group of users out there that want the rewards that come with multiyear arrangements."

The move was partly in response to AT&T, which introduced term plans for its virtually banded WATS services last year, Faulkner said.

In addition to expanding its Network WATS plan, US Sprint reworked Ultra WATS pricing for customers that do not enroll in the Network WATS program.

For those users, US Sprint will eliminate Ultra WATS' $50 monthly fee per location. The carrier will also lower Band 1 rates and evening rates in all bands, but it will raise daytime rates for Bands 2 through 5. The changes range from a 7% decrease in Band 1 rates to a 9% increase for Band 5 rates, according to Faulkner.

According to Daniel Briere, president of TeleChoice, Inc., a Manchester, Conn.-based consultancy, "By reducing or wiping out monthly charges, [US Sprint] is making it very tempting and easy for companies to sign up for their services." ◪

IBM, US West partner to trial ISDN BRI links

By Bob Brown
Senior Editor

SAN DIEGO — IBM and US West Communications, Inc. last week said they are conducting a trial that could enable personal computer users working at home to access office applications via ISDN links.

The trial, which will test the feasibility of delivering remote host computer applications over Integrated Services Digital Network lines to users at home, could make telecommuting practical by providing high-speed, dial-up links to corporate mainframes.

If the trial proves successful, it may lead to the introduction of commercial services, both companies said.

Long-range view

"We're conducting this trial with a long-range view of the economic and social ramifications," said Tom Pardun, vice-president and general manager of Large Business Services at US West Communications. "The pool of potential telecommuters could expand significantly."

> "We're conducting this trial with a long-range view of the economic and social ramifications," Pardun said.

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Typically, telecommuters use lower speed — 1,200 or 2,400 bit/sec — public network circuits, or alternatively, may opt for expensive dedicated lines to their corporate computer facilities.

IBM and US West Communications, the telephone company subsidiary of US West, Inc., are using their own employees to test the technology.

The trial, which began earlier this month and is expected to wrap up in May, was announced at the Western Communications Forum here, a conference held last week for communications vendors and users.

IBM employees in Denver and Boulder, Colo., are using an ISDN Basic Rate Interface (BRI) service provided by US West to connect to a local node on the IBM Information Network (IIN), an X.25 value-added network. From there, users can access electronic mail and business applications at IBM hosts via the IIN.

A US West employee in Englewood, Colo., for instance, is using ISDN and the IIN connection from home to install, maintain and debug software programs running at US West's Englewood data center.

Telecommuters participating in the trial are equipped with an IBM Personal Computer, which emulates a 3270 terminal, and an IBM 7820 ISDN Terminal Adapter, which carries the 3270 sessions to remote host computers over the BRI lines.

Participants will initially transmit documents at 19.2K bit/sec, but later, they will be able to send data at 64K bit/sec. The trial is only testing data transmission.

Both US West's ISDN lines and the IIN are being monitored via IBM's NetView/PC tool at the US West central office in Boulder.

This type of ISDN transmission setup could provide necessary bandwidth to users with data-intensive network requirements, such as transmitting large files or using graphics applications, said Tim Scholl, staff engineer for the IIN's Network Engineering and Design Group. A network manager might find such a link useful in solving a network problem while at home, he said.

"With this kind of connectivity, you can really get close to, if not better than, [the performance] you can get in the office," Scholl said. ☑

Faxing lets daily papers provide up-to-the-minute 'zoned' news

By Tom Smith
New Products Editor

Facsimile technology is having a dramatic impact on the newspaper industry as a growing number of publications take advantage of faxing to offer up-to-the-minute news summaries at a premium price.

Several daily newspapers, including *The New York Times, The Hartford Courant* and both major dailies in the Minneapolis area, have implemented fax distribution of capsule versions of their publication, which provide a glimpse of stories to appear in the next day's papers, as well as late-breaking business news such as closing stock prices.

Newspaper industry experts liken these fax offerings to "zoned" editions geared toward a specific audience. Zoning, or tailoring of news, is an increasingly important consideration as the market penetration of metropolitan dailies declines, partly because of the growth of specialized trade and consumer publications. They may also represent a new profit source for

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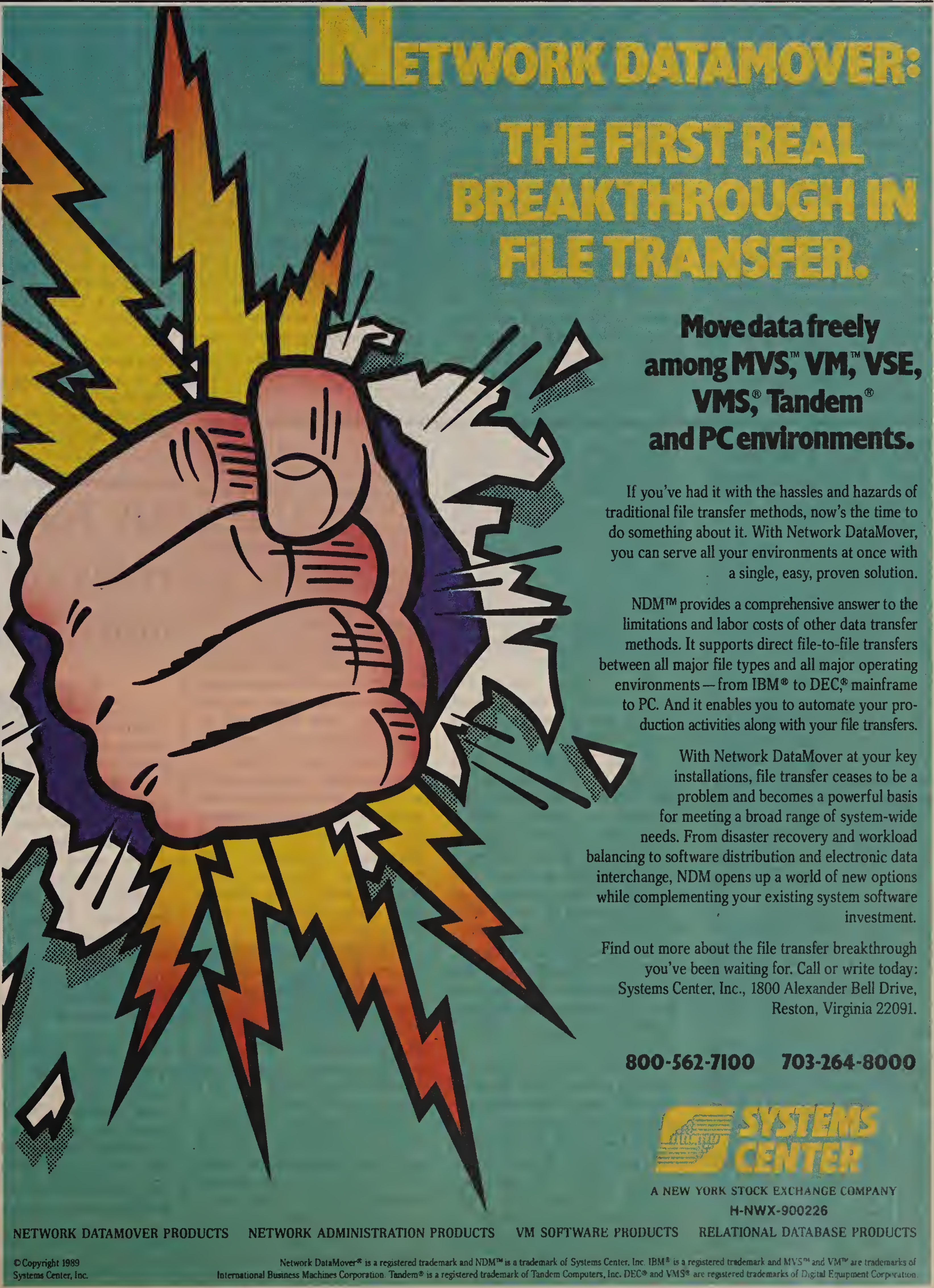

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Troubled Texas Air sells reservation system to EDS

Deal gives EDS half ownership of reservation net and half of carrier's Airline Services Division.

By Joe Panepinto
Staff Writer

NEW YORK — Beleaguered Texas Air Corp. last week sold off half of its System One reservation network to Electronic Data Systems Corp. (EDS) for $250 million in a wide-ranging deal designed to bolster the airline's cash reserves.

Under the agreement, EDS acquired System One's Airline Services Division, which handles flight management and passenger processing services for almost 200 air carriers around the world. Also EDS won a 10-year contract to handle data processing chores for Texas Air subsidiaries Eastern Air Lines, Inc. and Continental Airlines, Inc.

The deal, announced at a press conference here, calls for the transfer of two-thirds of System One's 3,300 network personnel to four technology centers and two regional communications facilities run by EDS. All 2,200 technical workers will become employees of EDS.

The remainder of System One employees — primarily marketing, sales and customer service personnel — will work in the joint EDS/System One reservation network partnership, which will be based in Miami.

System One laid off or transferred more than 400 employees last year after Texas Air scrapped plans for a $30 million, nationwide T-3 network ("System One bounces back in tough times," *NW,* Aug. 14, 1989).

Although EDS and Texas Air said there will be no initial layoff of System One employees, airline analysts contacted by *Network World* were unsure whether the merger would mean additional layoffs.

"It appears EDS is going to absorb some of the systems employees," said Paul Zorfass, an analyst at The Yankee Group in Boston. "But I doubt if they're going to keep them all."

Texas Air had been looking for a buyer for System One for almost a year in hopes of garnering much-needed cash and streamlining operations ("System One on the block, EDS a bidder," *NW,* Sept. 25, 1989).

Analysts said the $250 million deal with EDS will not only give the carrier some monetary breathing room, but it will also jettison some of Texas Air's more peripheral operations.

"They're trying to bolster their cash reserves," said David Pizzimenti, an airlines analyst at Nomura Research Institute in New York. "This is a good way for them to recoup some of their investments in System One and to get someone to share the costs of upgrades."

Airlines throughout the industry have been merging and outsourcing parts of their computer reservation systems over the past two years.

United Air Lines, Inc. sold off its stake in the Apollo system to six other airlines, and Delta Air Lines, Inc. last month announced plans to merge its Datas II network with the PARS network owned jointly by Trans World Airlines, Inc. and Northwest Airlines, Inc.

The push to merge airline reservation systems has grown out of an increased need to improve customer service and achieve economies of scale, analysts said. And although EDS is outside the airline industry, it will bring Texas Air many of those cost advantages by handling its airline services work and sharing the cost of upgrades to the reservation system.

Motorola to invade net mart with RISC servers

By Laura DiDio
Senior Editor

SCHAUMBURG, Ill. — Motorola, Inc. is expected to make its initial foray into the networking market when it announces a line of Unix-based Reduced Instruction Set Computer (RISC) servers at a press conference in New York next Monday.

Motorola will introduce three servers that use the company's 88000 RISC microprocessors, company officials said.

The new servers will range from an entry-level version supporting small local-area networks of less than 10 users to a high-end model that will support more than 250 users, according to sources close to the company who asked not to be identified.

The servers will support the Transmission Control Protocol/Internet Protocol and, in the future, Open Systems Interconnection protocols. The sources said the servers are designed to work in Ethernet LANs supporting MS-DOS, OS/2, Apple Computer, Inc. Macintoshes and Digital Equipment Corp. machines. The company hasn't indicated whether it will support token-ring LANs, the source said.

Sources close to Motorola told *Network World* that the company has begun discussions with Novell, Inc. to enable the new servers to support Novell's NetWare network operating system.

Motorola is positioning the servers to compete with the RISC System/6000 series workstations, including the new POWERservers, announced by IBM earlier this month. But as an incentive to users, OEMs and value-added reseller customers, the company will price its servers at minimum of 35% less than the comparable IBM models, according to Edward Staiano, president and general manager of Motorola's General Systems Sector. Pricing for the IBM RISC System/6000 starts at $20,000.

Analysts familiar with the Motorola servers last week said they were impressed with the technology and marketing strategy.

"It's a good price/performer and the servers are more high-powered than the IBM RISC 6000 series," said John Murphy, senior staff consultant at Wohl and Associates in Bala-Cynwyd, Pa. "Since they're already in the semiconductor business, they're bringing an economy of scale to the market that will be hard to beat."

Murphy added that Motorola "should have no trouble getting software vendors to port their packages to the new servers."

Fax lets papers give latest news

continued from page 7

publications.

On March 1, *The New York Times* will begin trial distribution in Tokyo of a six-page summary of its news, dubbed TimesFax, according to William Adler, manager of corporate relations for the newspaper.

TimesFax is intended to satisfy readers in the Far East who can't receive the paper on a timely basis. "Because of the widespread use of fax [in Japan], this seemed like the way to fill this need simply and practically," Adler said.

The Times will transmit the publication via satellite to Tokyo; neither the details of final delivery nor the cost have been determined.

TimesFax should be launched for general availability in Japan within weeks after the trial distribution begins. Adler said *The Times* does not envision a similar service in the U.S., where the paper is readily available.

The Star Tribune in Minneapolis recently began distributing a single-page news summary with late business news, closing stock prices, world and national news briefs, and local news.

The newspaper will distribute the summary with the aid of a fax server that supports eight fax lines. If subscriber volume exceeds transmission capacity, the overflow will be delivered through a fax service such as those offered by AT&T and MCI Communications Corp., although Rick Petersen, product manager of the new service at *The Star Tribune*, declined to give specifics.

The $500-per-year service, dubbed Executive Fax, is geared toward businesses or other subscribers that want the latest news, according to Petersen.

"It's a business tool we feel people will buy," Petersen said. "People want to know what's going on as quickly as possible."

The St. Paul Pioneer Press Dispatch, a competitor to *The Star Tribune*, two weeks ago launched a similar service, dubbed NewsFax, that it distributes over the MCI Fax network. The $400-per-year service is a competitive tool that was originally conceived to better serve readers' needs, according to Don Bothun, controller for the paper.

Like *The Star Tribune, The Press Dispatch* is offering introductory, half-price subscriptions. Neither paper would cite circulation figures.

These papers' offerings follow that of a pioneer, *The Hartford Courant,* which implemented a $600-a-year service in April 1989. The paper distributes its daily publication through Southern New England Telephone Co.'s (SNET) SNET FaxWorks, a service offered by the SNET Service Group that broadcasts information over the SNET network.

The fax push could represent an effort to win back readers who have abandoned metropolitan dailies in favor of local papers that offer more news of interest to the reader, said Bill Solimeno, a consultant for Media, Pa.-based Seybold Publications, Inc., which produces two newsletters on the publishing industry.

"Rather than sending a five-pound newspaper, this would allow them to take information that pertains to someone and fax them just what they want to read," said Solimeno, comparing the service to zoned editions.

Steven Ross, assistant professor of journalism in the Graduate School of Journalism at Columbia University, said fax editions let newspapers personalize their publications. "In a sense, a fax news summary is the ultimate zoned edition. You could create a newspaper for one."

Samuel Kennedy, chairman of the newspaper department at the S.I. Newhouse School of Public Communications at Syracuse University in Syracuse, N.Y., added, "In the midst of an information glut, any service that can boil it all down and give it to us in a neat package is attractive."

But the products could be a tough sell, according to Bill Lofquist, publishing analyst for the U.S. Department of Commerce in Washington, D.C. "Some companies may think their top executives need this, but others may see it as information overkill."

NIU Forum ready to move ahead

By Tom Smith
New Products Editor

DALLAS — The executive steering committee of the North American ISDN Users' (NIU) Forum will vote at next week's meeting in Dallas whether to enter into a Cooperative Research and Development Agreement (CRDA), which would guide the forum's operation.

CRDAs are part of the federal Technology Transfer Act of 1986, which allows the National Institute of Standards and Technology (NIST), sponsor of the forum, to enter into projects of mutual interest with outside organizations, such as companies involved in the NIU Forum.

Approval of the agreement would put an end to an organizational review initiated at the group's last meeting in Phoenix because of concerns within NIST that management of the group was draining its limited financial and personnel resources.

The forum is the agreement

"The joint activity that's the subject of the agreement is the sum and substance of the forum," according to Michael Rubin, deputy chief counsel for NIST in Gaithersburg, Md. "In essence, the forum becomes the cooperative agreement."

If approved by the forum's executive steering committee, the CRDA will formalize the role of both parties and define the activities in which the forum will engage, said James Kendrick, chairman of the forum's ISDN Users' Workshop. "To the casual observer, there will not be any change," he added.

Moratorium to end

Ratification of the document would end a moratorium that had been imposed on outside activities until the review was completed. This moratorium put on hold an ISDN interoperability event that had been tentatively scheduled for the spring of 1991.

"I have no doubt we'll do something, and I still want to do it in '91," said Ron Aitchison, chairman of the application service group, which oversees the event. Aitchison said he is concerned the interoperability demonstration will be upstaged by a similar event to be held in October 1991 in Geneva. "My concern is that no one remembers who flew [across] the Atlantic second," he said.

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C. Please Answer ALL Questions, Sign & Date the Form.

1 Industry: (check one only)

01. ☐ Manufacturers (other than computer/communications)
02. ☐ Finance/Banking
03. ☐ Insurance
04. ☐ Real Estate
05. ☐ Healthcare Services
06. ☐ Legal
07. ☐ Hospitality
08. ☐ Retail/Wholesale Trade
09. ☐ Transportation
10. ☐ Utilities
11. ☐ Education
12. ☐ Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry)
13. ☐ Government State/Local
14. ☐ Government Federal
15. ☐ Military
16. ☐ Aerospace
17. ☐ Consultants (independent)
18. ☐ Carriers
19. ☐ Interconnects
20. ☐ Manufacturers (Computer/Communications)
21. ☐ VAR/VAD/Systems House
22. ☐ Distributor, Computer Related
23. ☐ Distributor, Communications Related
24. ☐ Other ____________

2 Job function: (check one only)

1. ☐ Networking Management (Responsible for both voice & data)
2. ☐ MIS Management (VP, Dir., Department Head)
3. ☐ Corporate Management (Chairman, President, Owner, General Manager, CEO, CIO, VP)
4. ☐ Data Communications Management (Responsible for data only)
5. ☐ Telecommunications Management (Responsible for voice only)
6. ☐ Financial Management
7. ☐ Engineering Management
8. ☐ Consultant (Independent)
9. ☐ Other ____________

3 What is the scope of your involvement in purchase decisions for Network/Communications products + services? (check one only)

1. ☐ Enterprise Wide (Organization/Subsidiary/Division)
2. ☐ Multi Enterprise (Consultants)
3. ☐ Department Wide

4 What is the total number of sites for which you have purchase influence?

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1

5 Your primary responsibility: (check one only)

1. ☐ Both Data + Voice
2. ☐ Data Networking Only
3. ☐ Voice Networking Only
4. ☐ None

6 Which transmission media do you use in your network: (check all that apply)

Public:
01. ☐ Switched-Based (DDD, Wats, Megacom, etc.)
02. ☐ Leased Line (not including T-1)
03. ☐ T-1
04. ☐ Fractional T-1
05. ☐ T-3/SONET
06. ☐ Broadband
07. ☐ ISDN

Private:
08. ☐ Satellite
09. ☐ Microwave
10. ☐ Fiber Optic

7 Is your network: (check all that apply)

LOCAL AREA NETWORK
1. ☐ Local (within building)
2. ☐ Local (in a campus environment)

WIDE AREA NETWORKS
3. ☐ International
4. ☐ National
5. ☐ Regional (several states)
6. ☐ Metropolitan

8 What is your network architecture? (check all that apply)

1. ☐ SNA
2. ☐ DECNET
3. ☐ OSI
4. ☐ GOSIP
5. ☐ MAP/TOP
6. ☐ TCP/IP
7. ☐ DCA (UNISYS)
8. ☐ OTHER ____________

9 What is your LAN Operating System? (check all that apply)

01. ☐ 3COM (3+, 3+open)
02. ☐ LOCAL TALK (APPLETALK)
03. ☐ BANYAN (VINES)
04. ☐ DCA (IRMALAN)
05. ☐ IBM (LAN Server)
06. ☐ IBM (PC LAN PROGRAM)
07. ☐ MICROSOFT (LAN MANAGER)
08. ☐ UNGERMAN BASS (NET/1)
09. ☐ NOVELL (NETWARE)
10. ☐ TOPS
11. ☐ PROTEON (PRONET)
12. ☐ OTHER ____________

10 What is your LAN environment? (check all that apply)

1. ☐ 4M TOKEN RING
2. ☐ 16M TOKEN RING
3. ☐ ARCNET
4. ☐ ETHERNET
5. ☐ STARLAN
6. ☐ FDDI
7. ☐ LOCALTALK
8. ☐ OTHER ______

11 Which operating systems do you utilize? (check all that apply)

1. ☐ IBM DOS (VSE)
2. ☐ UNIX
3. ☐ OS/2
4. ☐ OS/2 Extended Edition
5. ☐ MVS
6. ☐ VM
7. ☐ VMS
8. ☐ XENIX
9. ☐ PICK
0. ☐ OTHER ____

12 Please indicate by vendor the number of mainframes/minicomputers installed in your network.

VENDOR	MAINFRAMES A	MINIS B
01. DEC		
02. IBM		
03. AMDAHL		
04. AT&T		
05. BULL HN IS		
06. NCR		
07. DATA GENERAL		
08. WANG		
09. HEWLETT PACKARD		
10. PRIME		
11. TANDEM		
12. UNISYS		
13. CONTROL DATA		
14. OTHER		

13 Please indicate by vendor the number of microcomputers/workstations:

A. Presently installed in your network.

B. The approximate quantity you plan to install in the next 12 months.

MICROCOMPUTER/ WORKSTATION/ VENDOR	PRESENTLY INSTALLED A	PLAN TO INSTALL NEXT 12 MONTHS B
01. PCs based on 80286 chip		
02. PCs based on 80386 chip		
03. PCs based on 80486 chip		
04. 8086/8088		
05. Macintosh		
06. RISC-based workstations		
07. UNIX-based workstations		

14 What is your planned PC standard? (check all that apply)

1. ☐ EISA
2. ☐ MCA
3. ☐ NUBUS (MACINTOSH)

15 For which areas outside of the U.S. do you have purchasing influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East

16 Check ALL that apply in columns A and B

A) I am presently involved in the purchase process for the following products/services:

B) I plan to purchase the following products/services in the next 12 months:

Presently Involved A	Plan to Purchase B	LOCAL AREA NETWORKS:
01. ☐	☐	Local Area Networks
02. ☐	☐	LAN Servers
03. ☐	☐	LAN Services
04. ☐	☐	Cables, Connectors, Baluns
05. ☐	☐	Bridges, Routers, Gateways
06. ☐	☐	UPS
07. ☐	☐	LAN Storage Devices
A	B	COMPUTERS/PERIPHERALS:
08. ☐	☐	Micros
09. ☐	☐	Minis
10. ☐	☐	Mainframes
11. ☐	☐	Front End Processors
12. ☐	☐	Terminals
13. ☐	☐	Laptops
14. ☐	☐	Printers
15. ☐	☐	Work Stations
16. ☐	☐	Cluster Controllers

(continued on next column)

Presently Involved A	Plan to Purchase B	SOFTWARE:
17. ☐	☐	Network Management
18. ☐	☐	Micro to Mainframe
19. ☐	☐	Network Security
20. ☐	☐	Call Accounting
21. ☐	☐	Distributed DBMS
22. ☐	☐	Communications Software
23. ☐	☐	Applications Software
24. ☐	☐	Network Operating Systems Software
25. ☐	☐	EDI Software
26. ☐	☐	E-Mail Software
A	B	DATA COMMUNICATIONS:
27. ☐	☐	Modems (over 9.6kbps)
28. ☐	☐	Modems (under 9.6kbps)
29. ☐	☐	T-1 Multiplexers
30. ☐	☐	T-3 Multiplexers
31. ☐	☐	Fractional T-1 Multiplexers
32. ☐	☐	Data Switches
33. ☐	☐	Matrix Switches
34. ☐	☐	Packet Switches
35. ☐	☐	Protocol Converters
36. ☐	☐	Network Management Systems
37. ☐	☐	Terminal Emulation Boards
38. ☐	☐	Facsimile Machines
39. ☐	☐	Diagnostic Test Equipment
40. ☐	☐	DSU/CSU
41. ☐	☐	Data Security
42. ☐	☐	Data Compression Equipment
43. ☐	☐	Network Adapter Boards
44. ☐	☐	Microwave
45. ☐	☐	Messaging Software
A	B	TELECOMMUNICATIONS:
46. ☐	☐	PBXs (over 1000 lines)
47. ☐	☐	PBXs (200 - 1000 lines)
48. ☐	☐	PBXs (under 200 lines)
49. ☐	☐	Key Systems
50. ☐	☐	Automatic Call Distributors
51. ☐	☐	Voice Messaging Systems
52. ☐	☐	Video Teleconferencing Systems
A	B	SERVICES:
53. ☐	☐	Switched Voice
54. ☐	☐	Dedicated Leased Line
55. ☐	☐	T-1
56. ☐	☐	T-3
57. ☐	☐	Digital Data
58. ☐	☐	Packet Switched
59. ☐	☐	Centrex
60. ☐	☐	Central Office Lan
61. ☐	☐	Satellite
62. ☐	☐	On-Line Information
63. ☐	☐	ISDN
64. ☐	☐	EMail
65. ☐	☐	VSAT

17 Estimated value of networking equipment and services:

A: Which you helped specify, recommend or approve in the last 12 months?

B: Which you plan to help specify, recommend or approve in the next 12 months?

A	B	
1 ☐	☐	$100 million and over
2 ☐	☐	$50 - $99.9 mill
3 ☐	☐	$25 - $49.9 mill
4 ☐	☐	$20 - $24.9 mill.
5 ☐	☐	$10 - $19.9 mill.
6 ☐	☐	$5 - $9.9 mill.
7 ☐	☐	$1 - $4.9 mill.
8 ☐	☐	$500,000 - $999,999
9 ☐	☐	Under $500,000

18 Estimated gross annual revenue of your entire company/institution: (check one only)

1. ☐ over $10 billion
2. ☐ $1 to $9.9 bill.
3. ☐ $500 to $1 bill.
4. ☐ $100 to $499.9 mill.
5. ☐ $50 to $99.9 mill.
6. ☐ $10 to $49.9 mill.
7. ☐ $5 to 9.9 mill.
8. ☐ under $5 mill.

19 Estimated number of employees for your entire corporation:

1. ☐ over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ under 500

20 Which of the following ISDN products do you plan to purchase in the next 12 months? (check all that apply)

1. ☐ Basic Rate Interface Terminal Adapters
2. ☐ Primary Rate Interface Equipment
3. ☐ Voice/Data terminals
4. ☐ Voice-only terminals
5. ☐ Data-only terminals

21 From which of the following vendors will you consider buying your PBX/Central Office Switch? (check all that apply)

A PBX	B COS	
A ☐	☐	AT&T
B ☐	☐	ALCATEL
C ☐	☐	ERICSSON
D ☐	☐	FUJITSU
E ☐		HARRIS
F ☐		HITACHI
G ☐		ROLM
H ☐		INTECOM
I ☐		MEMOREX TELEX
J ☐		MITEL
K ☐	☐	NEC
L ☐	☐	NORTHERN TELECOM
M ☐		SAMSUNG
N ☐	☐	SIEMENS
O ☐		STROMBERG-CARLSON
P ☐		TOSHIBA
Q ☐	☐	OTHER ____________

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

"There will be a movement in the user community to pressure the [interexchange carriers] to develop a method for prioritizing telecommunications services so that in the event of a major disruption, key services would be less affected."

Excerpt from *Yankee Watch Communications* report
"Brownout Monday: How Reliable is Reliable?"
The Yankee Group
Boston

People & Positions

David Systems, Inc. last week said it has named **Charles Kaekel** vice-president of research and development. Kaekel replaces Mario Mazzola, who recently retired, the company said.

Kaekel was previously director of software development with David Systems.

In addition, the company appointed **Michael Sonaco** vice-president of sales and service. He takes over sales responsibilities from **Stephen Hester,** who previously was vice-president of sales and marketing; Hester was recently named vice-president of business development.

Sonaco most recently was vice-president of marketing and sales services with DSC Communications Corp.

US West, Inc. last week said it has named **John DeFeo** president of a newly formed division that will manage US West's worldwide interests in radio communications. That unit has not yet been named. The company also appointed DeFeo chairman of the board of US West NewVector Group, Inc., which operates 28 cellular networks in 15 Western states. Defeo has served as president and chief executive of that group since 1986. ◼

Agency set to recommend change in taxing carriers

Study finds competition not reflected in tax rate.

By Joe Panepinto
Staff Writer

WASHINGTON, D.C. — A 26-member intergovernmental agency will recommend next month that states stop taxing long-distance and local carriers as monopolies and begin treating them like other competitive businesses.

The Advisory Commission on Intergovernmental Relations (ACIR) is expected to release a study next month that urges states to drop gross receipts and utilities taxes on telecommunications service providers and replace them with competitive business taxes.

Currently, 15 states and the District of Columbia impose gross receipts taxes on telecommunications services: Alabama, Delaware, Florida, Indiana, Louisiana, Maryland, Montana, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, Vermont, Virginia and Wisconsin.

According to Robert Ebel, author of the study and director of finance at the ACIR, public utility taxes are traditionally higher than competitive business taxes, such as the sales tax. Public utility taxes were originally levied to offset the advantages enjoyed by monopoly companies, he said.

In the study, Ebel cites the breakup of AT&T and the emergence of competing long-distance carriers and local-loop bypass services as evidence that monopoly situations in telecommunications no longer exist in most areas.

That makes levying gross receipts and utilities taxes unfair because unregulated telecommunications providers are not charged the special tax, nor are competitive businesses in other industries.

In most states, adoption of the changes in tax policy could result in lower rates to users.

▲▲▲

In most states, adoption of the recommended changes in tax policy could potentially be reflected in lower rates to users. But with many state legislatures scrambling to cover escalating operating costs, it is unlikely they will

(continued on page 12)

INDUSTRY BRIEFS

Digital Equipment Corp. President Kenneth Olsen last week would not rule out the possibility of a first-ever quarterly loss and indicated that the company may offer a voluntary severance program. In an interview with the *Wall Street Journal,* Olsen said a loss for the third quarter ending March 31 "could happen" and admitted it is too late to institute any last-minute efforts to avoid a loss. He emphasized that DEC has not yet publicly predicted a loss for the quarter.

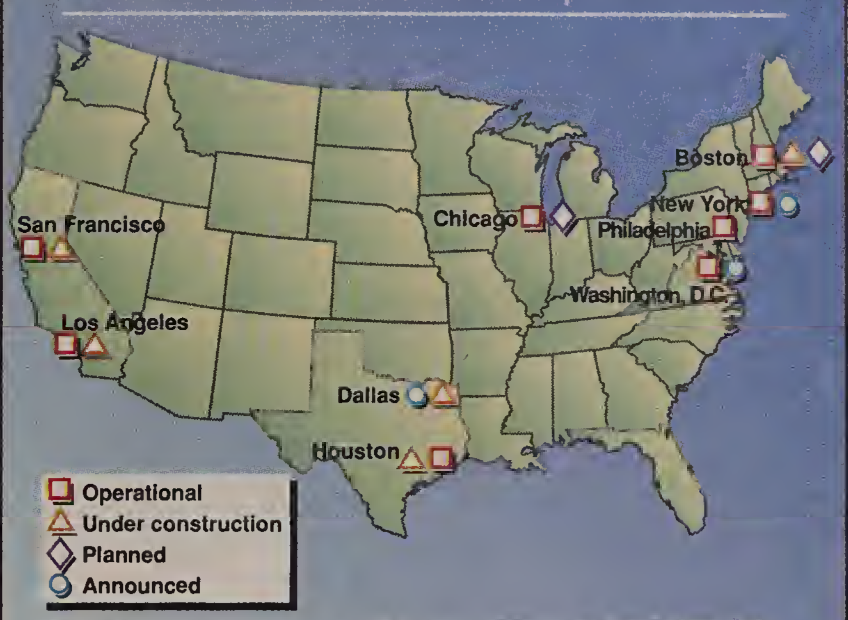
In addition, Olsen said the company's executive committee may try to entice up to 8,000 employees to take a severance package that would help trim the company's 125,900-member work force. He did not say when such a program would be offered. DEC is expected to experience order upturns later this year, when its VAX 9000 mainframe ships.

NTT Data Communications Systems Corp., a subsidiary of **Nippon Telephone and Telegraph, Ltd.**, last week said it plans to offer a broad mix of data services to Japanese companies operating in the U.S.

The company said it is spending $80 million to $100 million to build its first overseas data center — in Jersey City, N.J., just outside of New York City — to provide computing and data network services. NTT Data Communications already offers facility management, systems integration, software design and communications services to customers in Japan. It plans to set up and manage private and public transmission facilities for Japanese businesses here, and could further expand operations

(continued on page 12)

Alternative access carrier proliferation



Map is an extrapolation of a larger study, which details alternative access network growth. It shows only cities with multiple carriers.

GRAPHIC BY SUSAN J. CHAMPENEY

SOURCE: THE YANKEE GROUP, BOSTON

Alternative carriers face critical hurdles

Bypass upstarts could crowd market, touch off rate wars; users worry about carriers' stability.

By Bob Brown
Senior Editor

Although hailed by some as the new breed of telephone company monopoly killers, local alternative access carriers still face several hurdles before reaching long-term success.

Alternative access providers — such as Teleport Communications Group and Metropolitan Fiber Systems, Inc. — are not only pitted against local telephone companies in the competition for customers, but they are increasingly running into equally aggressive bypass carriers that are springing up in major metropolitan markets.

For users, greater competition among alternative access carriers will likely result in lower prices and new services, but it is also expected to force some bypass carriers out of the market.

Furthermore, alternative carriers are trying to resolve an image problem with users. Some potential customers remain skeptical about handing over critical network traffic to relatively unknown service providers.

The long-term financial stability of these carriers is also a concern of prospective clients. To date, analysts say only one alternative access carrier — Teleport Communications — is profitable. Many more have gone out of business or have had cable construction projects delayed.

Conservative outlook

Local alternative access service providers are attracting customers with high-quality, fiber-optic circuits that bypass the regional Bell holding company central office and link a customer to an interexchange carrier. This offers some clients, who demand highly reliable circuits, route diversity in their networks.

In a newly released report from The Yankee Group titled "Alternative Access Carriers: Emerging Competition in the Local Loop," the Boston-based market research firm estimates that alternative access carrier revenues will grow steadily from $60 million in 1989 to $150 million by 1991.

The long-term financial stability of these carriers is a concern of prospective clients.

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Mark Lowenstein, The Yankee Group telecommunications analyst who authored the report, said he is taking a conservative outlook toward the upstart carriers' growth. "It's easy to go wild about this market, but these companies have their fair share of obstacles," Lowenstein said.

Infighting

Among the most challenging hurdle is that "they may end up fighting each other instead of focusing on the [local exchange carriers]," Lowenstein said. This

(continued on page 12)

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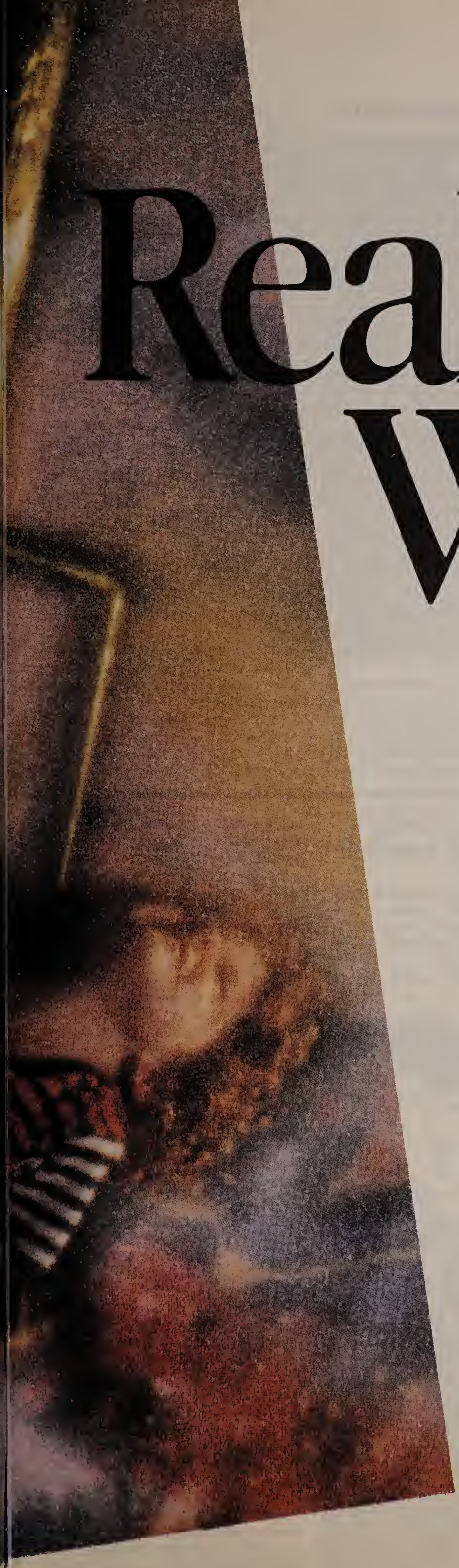

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You and Your Local Phone Company

AT&T
Network Systems

Industry Briefs

continued from page 9

to serve U.S. companies.

The company said it will begin offering service to customers in September. Initially, the company will help clients collocate computing gear at the Jersey City site and link that equipment to local and remote branch offices over dedicated, high-speed links. Over time, it plans to train customers' employees to run data networks.

Citing paltry growth in the personal computer market, **Apple Computer, Inc.** last week said it will lay off 400 workers — about 3% of its work force — as part of a company cost-reduction program.

The cuts will affect a variety of marketing, administrative and sales units, but Apple said it will continue to hire for and build its research and development department. The layoffs are the latest in a string of cost-reduction acts, Apple said. Over the past year, the company has slowed hiring in certain sectors, significantly reduced discretionary spending on travel and decreased its reliance on contractor services.

Cincinnati Bell Telephone last week said a federal judge has dismissed a federal suit in which three former police officers and a local official charged the company with illegal wiretapping activities.

According to a company spokeswoman, Cincinnati Bell was named in the suit based on information supplied to authorities by two former Cincinnati Bell employees who alleged the telephone company made more than 1,500 illegal wiretaps of politicians, media representatives and others. Cincinnati Bell then filed a civil defamation suit against the former employees and, in January, won the case. Consequently, the company asked that the federal case be dismissed.

Western Union Corp. and **GE Information Services** recently said they will interconnect their electronic messaging networks via the X.400 messaging standard, enabling users to exchange mail over the two networks for the first time.

The agreement will link 250,000 mailboxes on the Western Union 400 service with about the same number of mailboxes on GE Information Services' Quick-Comm private E-mail network. A GE Information Services spokesman said the company will soon announce an agreement to link 190,000 mailboxes on its GEnie public mail net to Western Union's EasyLink net.

SynOptics Communications, Inc. last week posted healthy revenue and earnings gains for its fiscal year ended Dec. 31, 1989.

The company, which sells local-area network wiring systems and network management software, reported earnings of $3.28 million, or 39 cents per share, vs. $1.91 million, or 26 cents per share, a year ago. Revenue climbed to $77.28 million, compared with $40.1 million in fiscal 1988.

Data base giant **Oracle Corp.** last week announced its Third Party Network Products Program, which provides customers with a number of non-Oracle network products to use in tandem with the company's data base offerings.

Products offered through the program have been certified by Oracle to work with Oracle's SQL*Net across networks supporting the Transmission Control Protocol/Internet Protocol.

"This program places us firmly on the road to becoming a one-stop shop for customers who require a complete solution for their network," said Smokey Wallace, vice-president of the Network Products Division.

Oracle has already certified products from Fibronics International, Inc., a Lowell, Mass., supplier of network adapters for fiber-optic networks; FTP Software, Inc., a Wakefield, Mass., supplier of TCP/IP software; Racal InterLan, of Boxborough, Mass., which offers a TCP/IP gateway to Novell, Inc. NetWare local-area networks; and The Wollongong Group, Inc. of Palo Alto, Calif., which offers TCP/IP for Digital Equipment Corp. VMS systems.

Agency recommends change in taxing

continued from page 9

adopt any scheme that will lower state tax revenue.

In some states, rates could even increase if the change were adopted.

For example, if Maryland were to replace its 2% gross receipts tax with a 5% state sales tax, the result would be a 3% increase in taxes and, in turn, in cost to the end user.

Also, in many states, competitive business taxes are collected locally and not at the state level, making a shift in tax policy costly to the state. Such a situation may deter many states from following the recommendations of the survey.

New York is currently proposing an additional 6% excise tax to be tacked on top of its gross receipts taxes. That cost would fall directly on the shoulders of telecommunications customers in the state, while significantly increasing the amount of revenue for the state.

"I think the basic idea of applying a sales tax in lieu of a utilities tax is a good idea," said Page Montgomery, vice-president of Economics and Technology, Inc., a telecommunications consulting firm in Boston. "It's just that there are all these potential pitfalls."

Any taxes specific to the telecommunications industry — be they public utility or add-on taxes like those proposed in New York — are opposed by the long-distance carriers, which have been pushing for neutral tax treatment of the telecommunications industry.

"We don't want states to propose any tax that results in a dramatic windfall for the state," said Kathleen Oleinyk, manager of legislation for AT&T, who said she also expects only states with roughly identical competitive and public utility rates to adopt the ACIR recommendations. "We should be getting a decrease in taxes, but in reality, we'll probably be trading off for something that's revenue-neutral."

Regardless of whether the total tax burden on long-distance carriers and local carriers rises, falls or remains the same, users in any state that turns over gross receipts taxes for competitive business taxes would see another line item on their bills since carriers pass on state sales taxes in the form of a direct surcharge. Gross receipts taxes are passed on indirectly via higher tariffs.

> "I think the basic idea of applying a sales tax in lieu of a utilities tax is a good idea," Montgomery said.
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For a copy of the ACIR study titled, "State Taxation of Telecommunications," call (202) 653-5540. Copies are available for $15.

Alternative carriers face critical hurdles

continued from page 9

competition could be counterproductive if the alternative access carriers wind up knocking each other out through a price war instead of challenging the RBHCs' network reliability, he said.

In a number of cities, including Boston, Chicago, Philadelphia and San Francisco, multiple alternative access carriers have sprung up recently (see graphic, page 9). Competition — in the form of price cutting — has already begun to heat up in some cities, observers said.

"I'd expect to see a shakeout over the next few years," Lowenstein said. "There are only so many customers in some of these downtown areas."

While a shakeout could scare off some users as various alternative access carriers are forced to bail out of the market, observers said competition among the Bell challengers could also benefit users. Competition would likely force prices from both traditional and alternative carriers down further and spur the availability of new services such as local-area network connectivity offerings, observers said.

"The more, the merrier, as far as I'm concerned," said Kerry Overlan, director of telecommunications at Com/Energy Services Co. in Cambridge, Mass., which is not yet served by alternative access carriers. "All you have to do is look at what happened when AT&T started getting competition to know the benefits this should bring to users."

Roger Cawley, manager of public affairs at Teleport Communications, which operates alternative access nets in such large cities as New York and Chicago, said he foresees the industry splitting into two basic groups of carriers.

Teleport and other carriers will position themselves as providers of highly reliable networks, while others will compete more as low-cost providers, he said, adding that "We see users looking for reliability."

The strongest carriers may be those that set up shop in a number of cities across the country so that they can offer coordinated services to users with locations in multiple cities, Lowenstein said.

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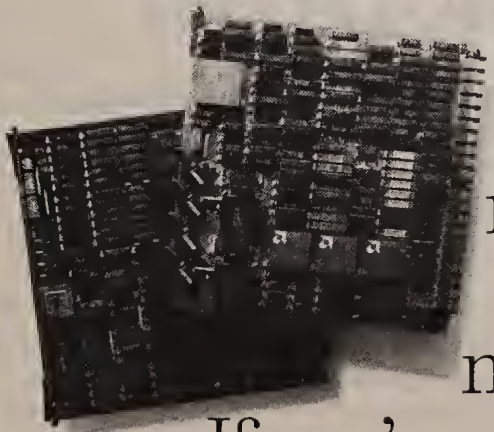

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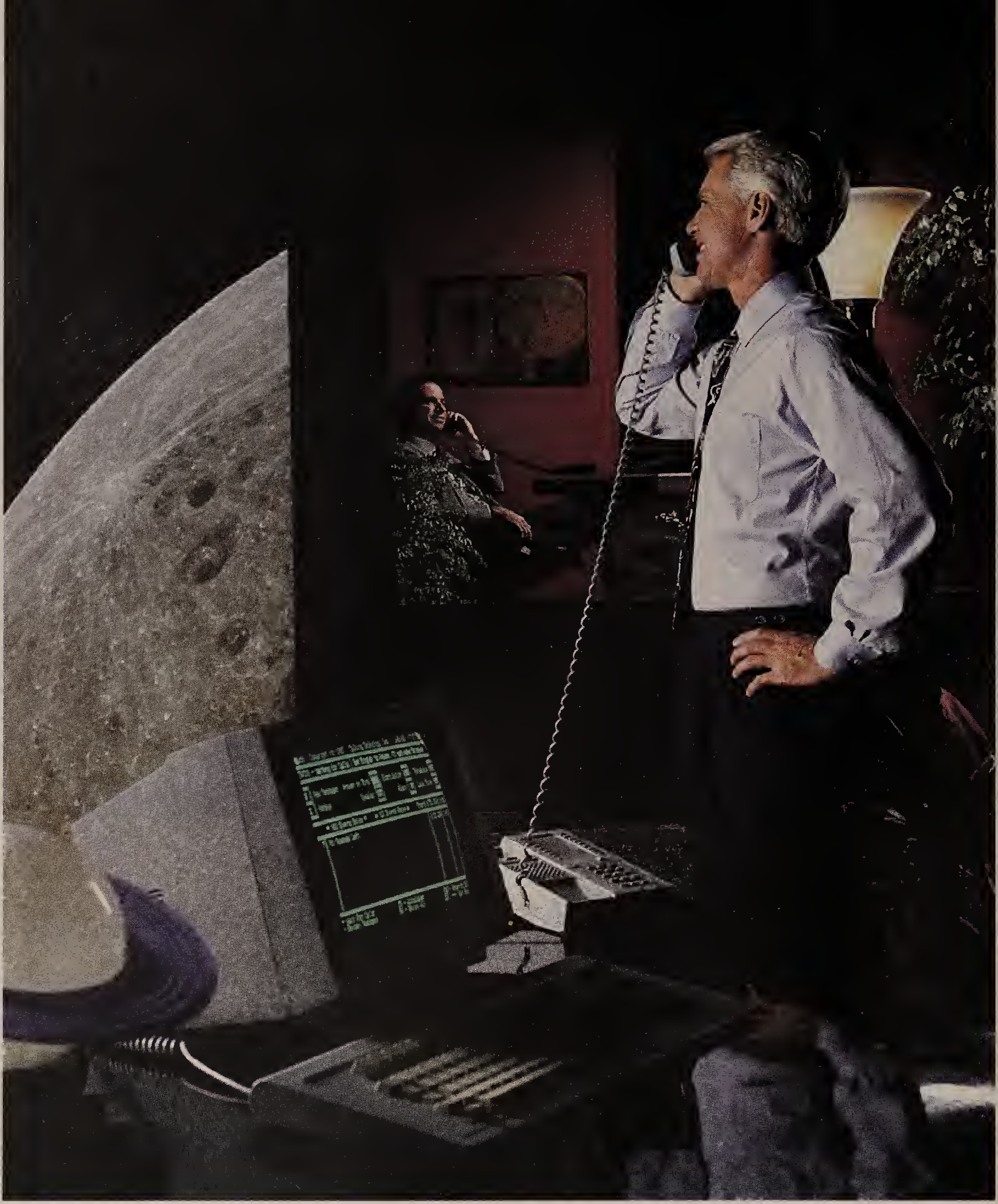

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Worth Noting

> "It's really a free-for-all out there now. Users don't have any solid guidelines that they can pass on to their wiring contractors and feel comfortable with."

Peter Bennett
Vice-president for the Telecommunications Industry Association, commenting on the need for an open wiring standard.

Carrier Watch

Illinois Bell Telephone Co. and Data General Corp. last week announced successful testing of a DG Integrated Services Digital Network Primary Rate Interface (PRI) to an Illinois Bell switch.

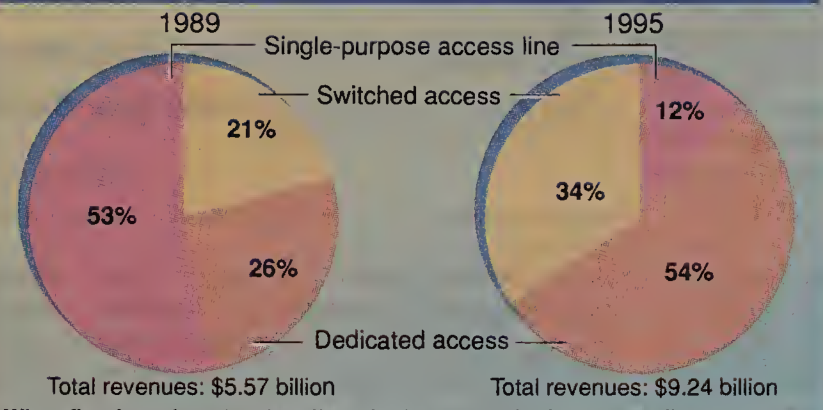
In the test, Fujitsu America, Inc. telephones supporting ISDN Basic Rate Interfaces accessed an AT&T 5ESS switch in an Illinois Bell central office. The switch sent the call over an ISDN PRI line to a DG Eclipse MV/10000 superminicomputer equipped with a PRI interface.

Although Illinois Bell does not yet offer PRI service, it said it will file a tariff with the Illinois Public Service Commission later this year.

Bell Atlantic Corp. recently said that its Centrex line growth in its six-state region in 1989 was 8%, bringing the total number of lines in use to 1.7 million as of Jan. 1, 1990. Centrex sales grew 5.1% in the over 400-line market, 11.8% in the 101- to 400-line market and 18.5% in the market for 100 lines or less.

Williams Telecommunications Group, Inc. (WTG), a Tulsa, Okla.-based national carrier, last week said it can provision T-1 service in 12 days, digital data service in 45 days, 64K bit/sec DS0 service in 20 days and perform cross-connects in three days. In addition to selling capacity to other carriers, WTG sells directly to users.

800 service usage trends



When first introduced, subscribers had to use a single-purpose line to access 800 service. Now companies also offer switched or dedicated access, such as T-1 lines, with 800 service.

SOURCE: MARKET INTELLIGENCE RESEARCH CORP., MOUNTAIN VIEW, CALIF.
GRAPHIC BY SUSAN J. CHAMPENY

RBHCs make headway in quest for market freedom

Carriers gaining ground with FCC and Congress.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — The regional Bell holding companies have garnered support from both the Federal Communications Commission and Congress in their effort to have business restrictions lifted from them.

During the past year, the RBHCs have mounted a massive grass roots effort to build public support for their entrance into manufacturing and information services, as well as long distance — markets currently off limits to them under terms of the Modified Final Judgment. The RBHCs have reportedly spent millions of dollars on studies, public opinion polls and advertisements on the subject.

FCC Chairman Alfred Sikes said his agency is ready and willing to assume oversight of the RBHCs if they are allowed into new business ventures. Currently, the Modified Final Judgment business restrictions are overseen by U.S. District Court Judge Harold Greene.

At a hearing earlier this month, Sikes assured Congress that, despite chronic budget cutbacks, the FCC can handle new oversight responsibilities. He claimed that the recent FCC investigation into misconduct in procurement practices at Nynex Corp. — which led to stiff fines against the company — proves the FCC has the resources to do the job.

A boost for the Bells

Earlier this month, the RBHCs got an even bigger boost when Rep. Edward Markey (D-Mass.) released a draft version of a bill he plans to introduce that would give the RBHCs greater freedom in the manufacturing arena and enable them to provide information services, subject to certain safeguards. Public hearings on the draft are scheduled for early March.

The bill would allow the RBHCs to provide information services, including electronic Yellow Pages, both inside and outside their serving regions. Before the RBHCs can enter this new business area, however, the FCC must approve their Open Network Architecture (ONA) plans.

ONA plans will specify exactly how the RBHCs will provide access to their network for competing enhanced service providers. The seven RBHCs have already submitted ONA plans and revisions, and the FCC is currently evaluating those proposals.

> Sikes assured Congress that the FCC can handle new oversight responsibilities.

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Markey's bill would require the FCC, during its review, to ensure that the RBHCs unbundle network services whenever possible and provide reasonable uniformity of features and functions. It would also ensure that RBHCs include a schedule for the timely introduction of ONA services and don't discriminate in their provision of service.

As a further safeguard, local carriers offering electronic Yellow Pages would not be allowed to update those services more than once per month for the first 24 months of service. Electronic

(continued on page 16)

AT&T adds language translation service

Early users praise Language Line interpretation service for non-English-speaking customers.

By Anita Taff
Washington Bureau Chief

NEW YORK — AT&T recently rolled out a language translation service for corporations and government agencies that serve large numbers of non-English-speaking customers.

The service, dubbed AT&T Language Line, provides around-the-clock translation for 143 languages and dialects. The service, which was praised by customers, was developed and has been marketed since 1984 by Communication and Language Line, Inc., a Monterey, Calif.-based firm acquired by AT&T in August.

Language Line is currently available only on a monthly subscription basis, although AT&T officials said the service will be expanded for use by casual users in the future. The service carries three separate charges: a one-time subscription fee ranging between $1,000 and $1,500, a monthly fee of between $25 and $50, and a per-minute charge of between $1.94 and $2.75.

When working with a non-English-speaking client, the Language Line customer dials an 800 number and speaks to an operator, who patches the call through to an interpreter. AT&T officials said it generally takes 15 seconds to locate the correct interpreter and set up the three-way call.

AT&T officials declined to give any information about call volumes for the Language Line service. However, AT&T said it upgraded facilities supporting the service to handle greater volume, including adding an AT&T System 75 and a digital conferencing and switching system at the firm.

Merrill Tutton, AT&T vice-president of consumer services, said the service should be useful to corporations with international customers, government agencies providing social services, and municipal and county emer-

(continued on page 16)

WASHINGTON UPDATE

FCC gets heat for handling of access charges. A number of users groups and AT&T, usually on opposite sides of the regulatory fence, last week teamed up to launch a joint attack against the Federal Communications Commission's handling of regional Bell holding company access charges.

In a letter to FCC Chairman Alfred Sikes, the International Communications Association, the Ad Hoc Telecommunications Users Committee, the Consumer Federation of America and AT&T pressed the agency to move up the date for its review of access charge filings.

Although the RBHCs are scheduled to file annual revisions to their interstate access tariffs in April, there has been some indication that the FCC wanted to postpone this filing until two other proceedings that may have a profound impact on tariffs are completed. The FCC is currently working on a plan to implement price cap regulation for local carriers and is examining whether to adjust the RBHCs' current 12% rate of return.

The current access tariffs, which would be extended until a new filing, are based on cost projections from 1988.

The users and AT&T claim that because technology and other factors have changed substantially since the rates were set, failure to readjust the tariffs could result in millions of dollars in overcharges.

Since the access charge structure was established at divestiture, annual reviews of local carrier costs and rates have resulted in billions of dollars in rate reductions, the groups said.

Reductions lessened the amount users paid for special access lines and lowered long-distance prices.

"It is not in the public interest and certainly not in the interest of the interexchange carriers or their customers to deny the opportunity to bring interstate access charges closer to proper economic cost," the letter said.

RBHCs make headway in quest

continued from page 15

Yellow Page operations would have to be set up in a subsidiary separate from the telephone unit; out-of-region information services would also have to be structured this way.

Markey's bill would also allow the RBHCs to engage in many facets of manufacturing that are currently prohibited, but it would not give blanket authority to fabricate equipment. The legislation would allow RBHCs to conduct research and design for telecommunications equipment and to produce software integral to network gear. These activities are currently prohibited.

Although the bill doesn't give direct authority for the RBHCs to fabricate products, it does give the carriers increased flexibility. For example, the RBHCs could own up to 5% of a company that manufactures telecommunications equipment.

Also, the RBHCs would be able to apply to the FCC for permission to fabricate equipment if it is deemed to be in the public interest. The FCC would have to hold a public hearing, taking into account public comments as well as a statement from the Secretary of Commerce on how the manufacturing activity would affect the balance of trade, U.S. employment and competition.

If approved, manufacturing would then have to be conducted through a subsidiary separate from the telephone operation. Fabrication would have to be done domestically, and RBHC-produced telecommunications equipment would have to be made available to all telephone providers on equal conditions.

> Although the bill doesn't give direct authority for the RBHCs to fabricate products, it does give the carriers increased flexibility.
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The RBHCs would also have to give competing manufacturers equal opportunity to sell products to the phone companies, and the FCC would require a market test to ensure that prices charged by the RBHCs for equipment are reasonable.

Markey's bill retains the prohibition against RBHCs entering the interexchange telephone market. However, the carriers would be allowed to carry signaling information associated with a voice or data call on an interexchange basis. ◘

AT&T adds language translation service

continued from page 15

gency and rescue services.

Wayne Bowman, division vice-president for Hertz's worldwide reservation center, said the translation service has been a big help to the car rental company. Hertz has 5,000 locations in 120 countries and handles 20 million calls per year, including 12 million reservations. The firm also provides a 24-hour, 365-day-a-year emergency road service.

"Because of the worldwide nature of our business, it's not unusual for reservation agents to find [themselves] speaking to someone who does not speak English as a primary language," Bowman said. In the past, Hertz was able to handle more common languages such as French, German or Spanish with internal personnel.

However, there was a significant number of customers that couldn't be served because no one spoke their language.

> "All that whiz-bang technology didn't do us any good if we couldn't understand what the caller was saying."
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Language Line has benefited Hertz not only in providing better customer service, but also by helping them prevent car damage or loss. Customers can call and ask how to properly operate the car, Bowman said, which helps prevents the car from being abandoned or towed.

Paul Linnee, director of emergency communications for the city of Minneapolis, operates an enhanced 911 service that answers 750,000 calls per year. The system, which is used to dispatch fire, police or ambulance personnel, has worked well with one exception, he said.

"All that whiz-bang technology didn't do us any good if we couldn't understand what the caller was saying," Linnee said. "It wasn't until we became subscribers to the Language Line several years ago that we finally closed the missing link in our emergency service delivery system." Having an interpreter available helps dispatchers send the proper emergency personnel and helps rescue workers or police officers communicate with victims, witnesses or suspects at the scene, he said. ◘

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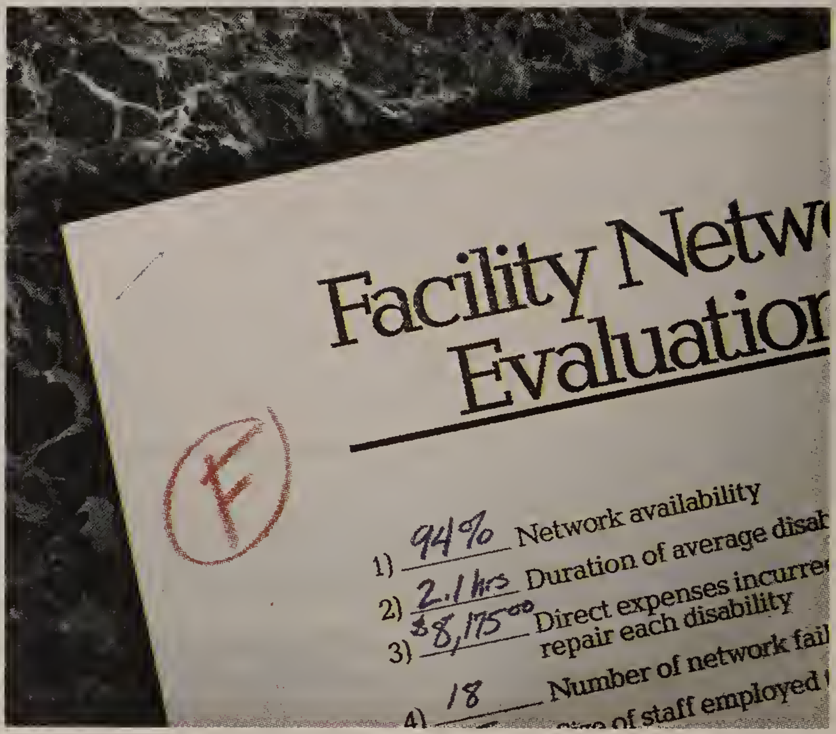
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Worth Noting

"Network disasters are a way of life. The big thing is, you must be prepared to deal with them."

Joseph Whiteaker
Vice-president
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Data Packets

Soft-Switch, Inc. last week announced 400-Link/OfficeVision, a gateway for linking IBM mainframes running OfficeVision software to X.400-based electronic mail networks. OfficeVision includes a proprietary E-mail component.

Like other members of the 400-Link product family, 400-Link/OfficeVision comes in two models. The Model 10 consists of an Intel Corp. 80386-based microcomputer with 4M bytes of random-access memory, a 40M-byte hard disk and software. The microcomputer includes two communications ports: one that supports LU 6.2 sessions with an IBM mainframe and another that connects to an X.25 network that supports X.400. The Model 10 costs $35,000.

The Model 20 consists of an 80386-based microcomputer with 8M bytes of RAM, a 322M-byte hard disk and software. It also features two communications ports to provide the link between the host and an X.25 network that supports X.400. The Model 20 costs $65,000.

The hard disks on both models are used to store 400-Link E-mail directories.

Soft-Switch said it will make 400-Link/OfficeVision available to users under a six-month pilot program, in which users get a Model 20, training and six months of use for $4,600. Users can apply the $4,600 fee toward the purchase of either a Model 10 or a Model 20.

The firm also said its existing 400-Link/DISOSS gateway has been enhanced to link mainframes running OfficeVision/MVS to X.400 nets. ◼

Pipeline firm builds VSAT net to carry mixed traffic

User estimates $30,000 per month in line savings.

By Tom Smith
New Products Editor

HOUSTON — Big Three Industries, Inc. is building a VSAT network that will enable it to combine traffic that previously ran over three disparate terrestrial networks, dramatically lowering data transmission costs.

The 50-node Ku-band network, of which nine nodes are currently operational, lops more than $30,000 off the company's monthly data transmission bill while helping the industrial gas pipeline company implement changes to the network configuration.

Reduced network costs and the ability to manage consumption of materials better will enable the user to provide its products and services at lower costs, according to Charles Harper, Big Three Industries' director of telecommunications, pipeline field and technical services metering and measurements.

Big Three Industries will transmit the bulk of its data at 9.6K bit/sec between offices, plants and headquarters through a shared hub here owned by GTE Spacenet Corp., from which it purchased the very small aperture terminals.

The company's data center is connected to the shared hub over a 9.6K bit/sec line, which will be replaced in late March by a microwave connection.

Each VSAT site will support the transmission of data that previously was transmitted over three sets of dial-up and leased lines. The VSAT network is capable of supporting Synchronous Data Link Control, X.25, asynchronous and Binary Synchronous Communications protocols, but Big Three Industries will only support SDLC and X.25 traffic.

An IBM Systems Network Architecture net for business applications previously utilized 10 multidrop 9.6K bit/sec lines.

A set of 1,200 and 2,400 bit/sec dial-up lines was used to support a Hewlett-Packard Co. 3000 minicomputer-based net supporting plant maintenance information. Now both the IBM and HP systems will transmit SDLC data over the same network.

The third network consisted of five multidrop 600 bit/sec circuits supporting a Digital Equipment Corp. VAX-based net for tracking pipeline gas volumes in a Supervisory Control and Data Acquisition system. The DEC system will now transmit data using X.25 protocols over the VSAT net.

Migration to VSATs also for the first time gives Big Three Industries the ability to centrally monitor and control the various remote sites, each of which previously were spread across differ-

(continued on page 18)

Maine lottery wins with N.E. Tel's off-tariff rates

By Jim Brown
Senior Editor

AUGUSTA, Maine — The Maine State Lottery Commission recently became the first user to take advantage of a state Public Utility Commission (PUC) decision that enables New England Telephone and Telegraph Co. to offer off-tariff rates and expand services without prior regulatory approval.

The decision enabled the Lottery Commission to sign a five-year contract to lease 9.6K bit/sec multidrop digital leased lines from the carrier for a total of $4.9 million, which is far below the cost for the 2,400 bit/sec multidrop analog circuits they will replace.

The circuits are used to link lottery terminals at 900 locations to a Stratus Computer, Inc. transaction processor here. That processor is operated by Scientific Games, Inc. under a data processing contract with the state.

The contract will enable the state to trim its communications budget by $1 million over five years. The savings are in addition to increased circuit speed and inherent performance improvements provided by digital service.

The faster circuits will help maintain 1½-sec response times on the network and enable the lottery to support increased traffic generated by the addition of new games, said Wally Soule Jr., lottery director for the state.

The Maine State Lottery Commission works with similar agencies in New Hampshire and Vermont to offer the Tri-State Megabucks, Daily Pick 3 and Pick 4 numbers games.

The Lottery Commission's

(continued on page 18)

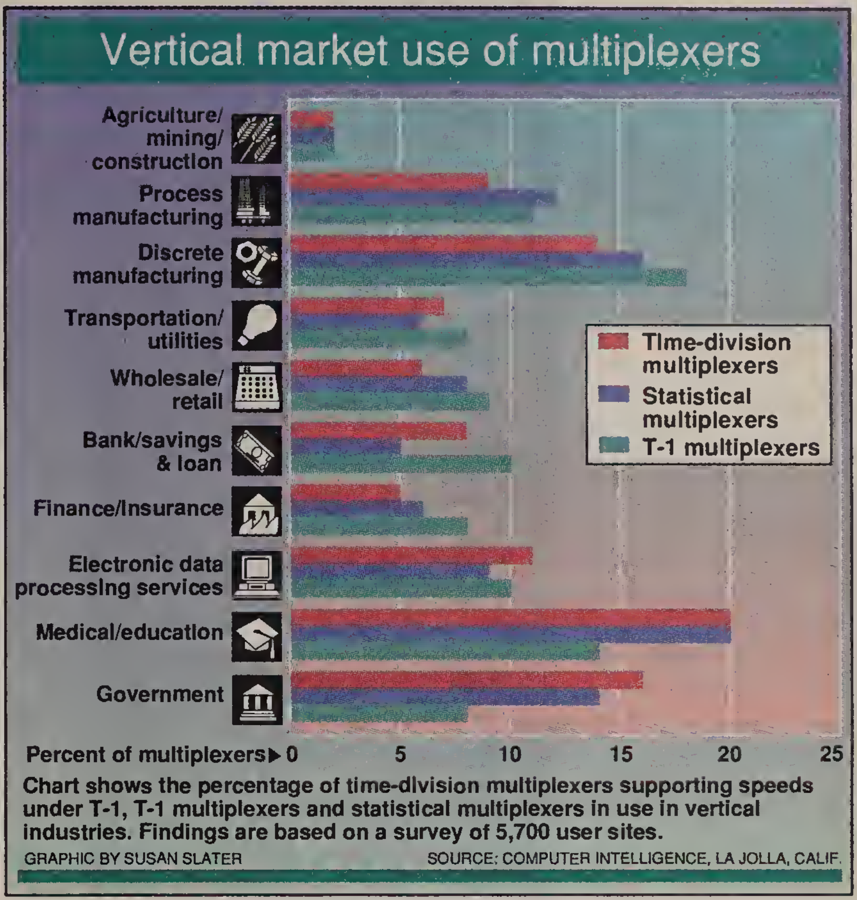

Chart shows the percentage of time-division multiplexers supporting speeds under T-1, T-1 multiplexers and statistical multiplexers in use in vertical industries. Findings are based on a survey of 5,700 user sites.

GRAPHIC BY SUSAN SLATER

SOURCE: COMPUTER INTELLIGENCE, LA JOLLA, CALIF.

Analysts warn of fax risk on backbones

Voice compression features of T-1 muxes could slow down or destroy fax data on backbone nets.

By Paul Desmond
Senior Writer

As facsimile machines proliferate throughout most companies, some users are trying to cut costs by supporting fax traffic over backbone networks, but they are running into roadblocks in the process.

The main problem in supporting fax traffic over a high-speed backbone today is that the voice compression techniques that most T-1 multiplexers use to squeeze more calls onto a backbone often slow down or even destroy fax data.

There is, however, a variety of equipment from fax machine and multiplexer vendors that help users avoid this pitfall.

In coming years, as Integrated Services Digital Networks become more widespread, some analysts predict the service will offer an ideal means of supporting high-speed fax transmission since users will only have to pay for the bandwidth they use.

In today's public switched network, fax calls are handled in the same way as voice calls, which means an analog Group III fax transmission that operates at 9.6K bit/sec takes up 64K bit/sec of bandwidth when digitized. For voice calls, most T-1 multiplexers use some derivative of adaptive differential pulse code modulation (ADPCM) to compress the 64K bit/sec channel to 32K bit/sec or less. But those techniques are not well-suited for fax transmission.

"If you intend to use voice compression, be sure that it is compatible with fax. Most currently available techniques aren't," said Howard Hecht, senior research analyst with Gartner Group, Inc., a Stamford, Conn., consultancy. "If you intend to use it, test it yourself with your fax machine."

> "If you intend to use voice compression, be sure it is compatible with fax," Hecht said.

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Even if the compression technique does work — meaning the fax transmission gets through intact — it will likely slow down fax traffic, said Timothy Zerbiec, a principal with Vertical Systems Group, a Dedham, Mass., consultancy.

ADPCM, for example, which supports 32K bit/sec voice transmission, typically slows a 9.6K bit/sec Group III fax transmission to 4.8K bit/sec, he said, because the compression techniques it applies to voice calls do

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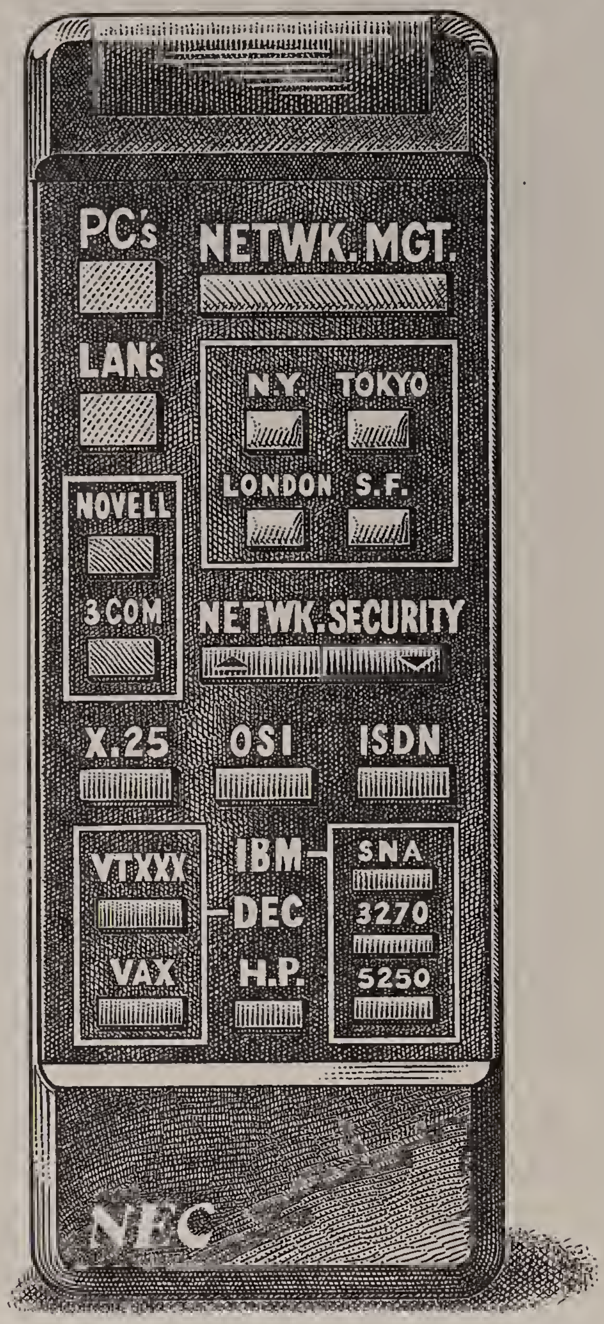

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See the FAXNeT Form on Page #57

Analysts warn of fax risk on backbones

continued from page 17

not work as well for fax and the machine has to revert to a fallback rate.

Some T-1 multiplexers, such as StrataCom, Inc.'s IPX FastPacket multiplexer, get around that problem with a feature that lets the switch detect fax traffic by reading its header. It routes the call around the IPX module that performs ADPCM so the fax call goes over the backbone unscathed.

Jeff Marshall, managing director of communications for Bear, Stearns & Co., Inc., said Network Equipment Technologies, Inc.'s Integrated Digital Network Exchange (IDNX) T-1 multiplexers let him configure fax traffic as virtual calls, which means the IDNX supplies bandwidth to fax machines as needed, instead of requiring users to dedicate channels for fax machines that are not always in use.

Marshall said he is also testing unreleased products that can detect a Group III analog fax signal, convert it to a 9.6K bit/sec digital signal for transmission through the network, then convert it back to an analog signal before it reaches the remote fax machine. He declined to name the manufacturer of the products he is testing.

Timeplex, Inc. recently announced a product that does precisely what Marshall described, although he said Bear, Stearns is not testing the Timeplex device ("Timeplex product digitizes faxes, speeds up routing," *NW*, Jan. 22).

IDNX supplies bandwidth to fax machines as needed.

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Another company with a similar technology is Republic Telcom Systems Corp., which has a board for its RLX line of multiplexers that demodulates Group II or III fax traffic so it can be transmitted over the backbone as a digital signal at either 4.8K or 9.6K bit/sec, respectively.

Some fax machines, including Ricoh Co., Ltd.'s 2100, are not equipped with modems, which means data comes out in a digital format that can be fed directly to a

(continued on page 53)

Firm builds VSAT net to carry mixed traffic

continued from page 17

ent nets. GTE Spacenet's Skystar net management system lets users configure individual nodes and collect statistics such as throughput, errors and failed ports.

This system can maximize utilization of bandwidth or optimize response time by increasing or decreasing the number of VSATs sharing a 56K bit/sec segment of bandwidth, according to Tom Shimabukuro, director of telecommunications systems and analysis for GTE Spacenet.

Big Three Industries also purchased extra VSATs, which allow it to implement a network change in about one-third the time required previously.

"Since we have three spares, we can deploy and install a VSAT, or make a change in about 15 days," Harper said, adding that the company is performing its own installations. "With a rented terrestrial network from one of the big common carriers, you're talking about a 45-day lead time."

In addition to the flexibility and network management capabilities gained, the user stands to save a substantial amount of money. Leased and dial-up lines cost about $42,000 per month, whereas VSAT network costs will run about $10,000 for expenses such as use of the shared hub and the microwave link to that hub.

This savings will translate into a competitive advantage, Harper said. "Because we have less cost, we can provide the same products for less by being able to manage and control energy consumption, personnel and the amount of maintenance."

As a secondary benefit, the company expects to realize significant savings by utilizing the VSATs' one-way video broadcast capability, which can be used to uplink programs such as employee training or benefits seminars to every node on the network, thereby saving on travel expenses.

Since the television signal is transmitted separately from the incoming data signal, video transmission does not interrupt data transmission, Shimabukuro said.

"Even if you don't use [the video capability] all the time, if you used it once, it's going to save a fortune," Harper said, although specific savings have not been determined.

The remaining 41 sites to be cut over will be operational by the end of March.

Maine lottery wins with N.E. Tel rates

continued from page 17

contract was drafted under provisions of an agreement struck between the Maine PUC and New England Telephone last June following an investigation into the regional carrier's rate structure in Maine.

The Stipulation

Known as the Stipulation, the agreement allows New England Telephone to ward off competitors by offering previously untariffed services or off-tariff prices for existing services, as long as its rates cover the cost of providing the service.

The Stipulation is also designed to encourage modernization of Maine's telephone network by enabling New England Telephone to roll out new services without having to gain regulatory approval.

The lottery contract, for instance, calls for New England Telephone to roll out its Digipath Digital Service statewide by upgrading its central offices with digital access and cross-connect systems. Currently, the Digipath Digital Service is only available in the Portland, Maine, area.

After upgrading the network to support the lottery, New England Telephone will be able to offer digital service to other users. "We think putting digital capability in Maine is going to be a great asset to the business community," Soule said.

The Lottery Commission looked to New England Telephone to provide the digital network after the task was balked at by three equipment vendors bidding to obtain the DP contract, which is up for renewal in June.

Scientific Games, GTECH Corp. and Control Data Corp. all entered bids for the DP contract. "But those companies all told us they would rather not handle the communications," Soule said.

LOCAL NETWORKING

PC AND TERMINAL-TO-HOST LANS, GATEWAYS AND MICRO COMMUNICATIONS PRODUCTS

Worth Noting

"OS/2 LAN Manager sales could represent up to 50% of all network operating system shipments by 1993. This leaves Novell's NetWare with less market share — about 35% — but with more revenue than their current sales since overall LAN shipments will increase."

Bill Redman
Program director of the LAN
communications service
Gartner Group, Inc.
Stamford, Conn.

Netnotes

Ashton-Tate Corp. recently introduced an add-on product for its Framework III suite of office applications that gives the application a front end to the OS/2 SQL Server being marketed jointly by Ashton-Tate and Microsoft Corp.

Called **SQL Link For Framework III**, the software utility lets users move data across a local-area network between SQL Server and Framework III.

Framework III includes a spreadsheet, word processor and data base, as well as outlining, telecommunications, graphics and electronic mail modules.

Priced at $49.95 and available next month, the utility provides users with an inexpensive interim solution while they await fully integrated SQL Server front ends, such as the much delayed dBase IV 1.1 Server Edition.

SQL Link For Framework can be used to download SQL Server data into Framework applications for manipulation and analysis, or to update SQL Server data bases from within those applications.

The product consists of two pieces: a Framework III macrocomputer that runs on the client and an OS/2 application

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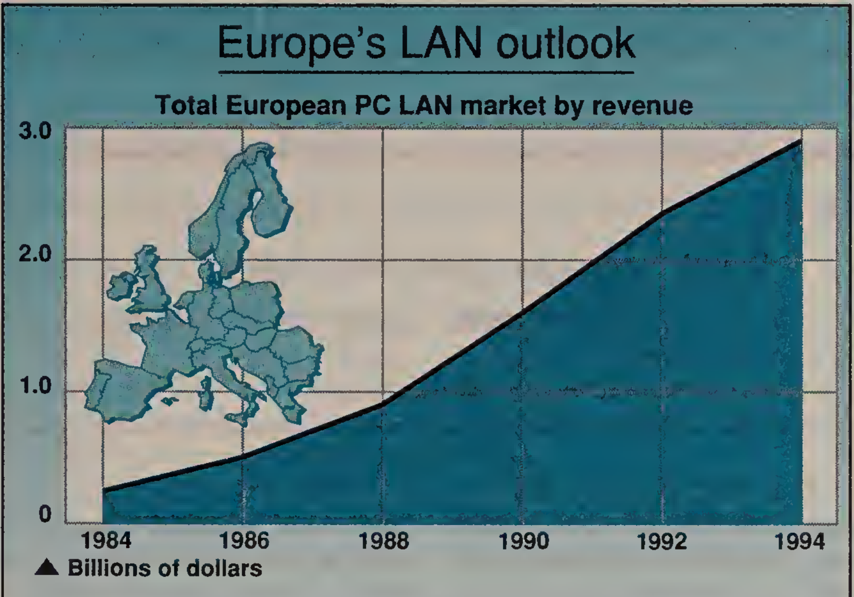

GRAPHIC BY SUSAN SLATER SOURCE: MARKET INTELLIGENCE RESEARCH CO., BRUSSELS, BELGIUM

European appetite for LANs growing at prodigious rate

LAN spending estimated to reach $3b by 1994.

By Laura DiDio
Senior Editor

BRUSSELS, Belgium — After a slow start, the appetite for local-area network products in Europe is beginning to ramp up at a rate comparable to that of the U.S. market, according to a recent study.

The report, by Market Intelligence Research Co. based here, predicts that European personal computer LAN shipments will have a 54% compound annual growth rate from 1988 to 1994.

In 1984, the Europeans spent about $233 million on LAN equipment, but by 1994, that figure will swell to nearly $3 billion, according to the study, titled "European PC LAN Markets: A Country By Country Analysis."

LAN shipments, which include adapters, servers and network printers, are expected to rise to more than 12 million units in 1994, according to Paul Schneckner, author of the report. In 1984, LAN shipments totaled just 42,600 units.

The number of personal computers supported by LANs, which is currently about a half million, is expected to increase to 2.6 million by 1994.

In 1985, European LAN shipments began to take off. The U.K., West Germany, France, Italy and the combined Benelux countries (Belgium, the Netherlands and Luxembourg) were the leading European LAN providers, respectively, Schneckner said.

Nearly 700,000 LAN connections were shipped in 1989, a 67.4% increase over the 410,000 LAN units shipped in 1988.

More recently, the West Germans and the French have surpassed the British as the largest European LAN suppliers. Last year, West Germany posted the biggest percentage of LAN shipments, with 22%; followed closely by France, which accounted for 21%; the U.K., at 19%; and the Scandinavian countries (Denmark, Norway, Sweden and Finland) at 15%.

The report forecasts that LAN shipments will continue to grow steadily for the next several years, leveling off at a healthy 35% to 40% growth rate in 1994. The report predicts that by then, 12.1 million LAN units will ship.

Like so many other markets, the demand for LANs will be fueled by the dismantlement of the trade barriers currently separating European markets.

LAN shipments are expected to rise to more than 12 million units in 1994.

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The physical, technical and fiscal barriers that will be eliminated by the proposed integration of the European market in 1992 will make it easier for European companies to sell their various products throughout the continent, Schneckner said.

From an international standpoint, Schneckner said, most multinational network companies have already penetrated the major European markets.

"U.S. companies have always viewed Europe as a single market," he said. "Although in the past, U.S. companies have centrally structured their administrative and marketing organizations, they are beginning to give more control to local offices in particular countries, helping to boost sales."

Gateway unites LAN Manager, NetWare

Racal InterLan's LIMES Gateway to allow LAN Manager users to access Novell NetWare servers.

By Laura DiDio
Senior Editor

BOXBOROUGH, Mass. — Racal InterLan recently announced a software gateway that will enable workstation users in a LAN Manager network to access Novell, Inc. NetWare servers.

Racal InterLan's LIMES Gateway software, due out this December, will run on an OS/2 workstation designated as a gateway and will enable workstation users to access NetWare and Portable NetWare servers as though they were LAN Manager servers.

LAN Manager users will be able to copy files from and share files with NetWare users, exchange electronic mail messages and access NetWare peripherals, according to Larry Backman, the company's software development manager.

Besides OS/2 LAN Manager networks, the LIMES Gateway can be used to link NetWare to networks that support the Server Message Block (SMB) protocol, including IBM's PC-Net, Microsoft Corp.'s MS-Net, 3Com Corp.'s 3+Open and Ungermann-Bass, Inc.'s Net-1.

The LIMES Gateway is the second product announced by Racal InterLan to integrate the LAN Manager and NetWare environments. Last summer, the company introduced the LMN Server ("Racal unit unites rival LAN worlds," *NW*, Aug. 21, 1989).

The LMN Server software runs on an OS/2 LAN Manager server and enables NetWare users to access LAN Manager servers as if they were NetWare servers.

"The difference between the two products is that the LMN Server allows NetWare users to access only a single LAN Manager server, whereas LIMES enables LAN Manager users to access multiple NetWare servers simultaneously," Backman said.

LIMES Gateway is the second Racal InterLan product to integrate LAN Manager and NetWare.

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Like the earlier LMN Server software, the forthcoming LIMES Gateway consists of two modules, Backman said. The first module contains the LAN Manager Network Basic I/O System Extended User Interface protocols, which are used to format data packets for transmission.

The second module is a LIMES translator, which converts the

(continued on page 20)

Vendors exhibit support for IEEE 10BaseT at show

By Walter Sweet
West Coast Correspondent

BOSTON — Vendors registered a vote of confidence in the IEEE 10BaseT draft standard for Ethernet on unshielded twisted pair by hosting an interoperability demonstration of 10BaseT products at the recent Networld '90 show here.

The purpose of the demonstration, called the Boston "10BaseT Party," was to show users that the industry believes the standard is stable. Many vendors at the show guaranteed to upgrade their products for free if the standard is revised.

Although the standard was approved by the IEEE 802.3's 10-BaseT task force last month, it will not be final until the IEEE Standards Board gives its official approval next September.

Vendors participating in the 10BaseT Party included Cabletron Systems, Inc., NetWorth, Inc., Asante Technologies, AT&T, I.Q. Technologies, Inc., Standard Microsystems Corp. and Xircom Products Corp.

Noteworthy by its absence was SynOptics Communications, Inc., sparking something of a controversy concerning SynOptics' support of the standard.

Sponsors of the 10BaseT Party said SynOptics — the industry leader of Ethernet products for twisted-pair wire — was invited to take part in the interoperability demonstration but declined.

SynOptics claimed it was nev-

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LAN Manager, NetWare unite

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LAN Manager core protocol packets — the filing protocols used by Microsoft to send data packets between file servers and workstations — into NetWare calls.

A LIMES Gateway will enable LAN Manager users to log onto NetWare and Portable NetWare servers, such as Data General Corp.'s new NetWare for AViion Systems, using standard LAN Manager commands, Backman noted.

"LAN Manager users don't have to learn any NetWare commands," he said.

The LIMES Gateway translates LAN Manager users' requests into NetWare calls and forwards them to the appropriate NetWare server.

They are then processed and returned to the OS/2 workstations, Backman said.

"Additionally, by using the gateway approach to do protocol conversion, we can also support Unix-based workstations such as Xenix Corp.'s Xenix Net or the new LAN Manager Unix workstations," Backman said.

This is possible because the LIMES Gateway can translate the SMB filing protocols used by all of these workstations into NetWare core protocols, he explained.

The LIMES Gateway

Randy Phillips, Racal InterLan president, said the company developed the LMN Server first because the installed base of NetWare users is larger than that of LAN Manager.

"Both products perform similar functions and are equally important to our users' long-term networking strategies," Phillips said.

"By developing products to link the NetWare and LAN Manager environments, we're saying to users: 'You don't have to make a choice. You can have both.' "

> "LAN Manager users don't have to learn any NetWare commands," Larry Backman said.

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The LIMES Gateway can support both Ethernet and token-ring networks and is interoperable with hardware and software drivers that are compatible with NetWare and OS/2 LAN Manager systems.

The LIMES Gateway requires an OS/2-based machine, such as an IBM Personal Computer AT or Personal System/2 with at least 4M bytes of memory, OS/2 Version 1.1 or NetWare Version 2.0a, 2.15 or 386.

Pricing has not yet been set, but a Racal InterLan spokesman said the product will probably be priced at about the same or a little more than the LMN Server software, which sells for $1,295.

Vendors support IEEE 10BaseT

continued from page 19

er invited to join the 10BaseT Party and pointed out that it installed and ran the official Networld network connecting the booths of many show exhibitors with its LattisNet 10BaseT products.

But members of the 10BaseT Party questioned whether those cards comply with the draft standard.

"If they're running 10BaseT here, I'd like to see it," said John McHale, president of NetWorth. McHale said he tried without success to connect SynOptics' LattisNet to the 10BaseT Party net.

SynOptics, which unveiled its first 10BaseT products at the show, maintains that its cards comply with the draft standard. Kevin Woods, product marketing manager for SynOptics, said his company's LattisNet was working with adapter cards from Racal InterLan, 3Com Corp., Tiara Computer Systems, Inc. and Western Digital Corp.

Despite the controversy, users at the show said they were confident the draft standard will not change and said they will start buying products before final approval is granted. However, one user, a manager for a major bank who requested anonymity, said the bank won't invest in 10BaseT products until the draft is finally approved.

One way or another, the future of Ethernet on unshielded wire looks bright. Lee Doyle, manager of local-area network research for International Data Corp., a research firm in Framingham, Mass., said the market is "poised for explosive growth."

Doyle said he expects the number of players that have jumped into the 10BaseT market will result in fierce competition which, in turn, will force prices down and lead to quick adoption of 10BaseT networks.

Netnotes

continued from page 19

that runs on the SQL Server machine. The latter takes queries from Framework III, communicates those queries to SQL Server and returns the results to Framework III.

Users with knowledge of SQL can write their own queries in Transact-SQL, the version of SQL native to SQL Server. For more casual users, such queries can be preprogrammed and stored for future use; pop-up menus guide users through creating, invoking and saving queries.

SQL Link For Framework runs on 3Com Corp.'s 3+Open LAN Manager 1.1 or higher and Novell, Inc.'s NetWare 2.1 or higher. It and Framework III together require 504K bytes of DOS memory. Framework III is priced at $695, and users of earlier versions of Framework can upgrade for $99.

For more information, contact Ashton-Tate at 20101 Hamilton Ave., Torrance, Calif. 90509; (213) 329-8000.

Enable Software of Alameda, Calif., announced an upgrade to its Higgins Exchange wide-area electronic mail manager that makes it possible to synchronize name directories across an enterprisewide network.

The capability, embodied in a new service called **Higgins Name Synchronization (HNS),** allows network managers to submit directory revisions and have HNS consolidate the changes and distribute the updates to all locations.

HNS will be included with Higgins Exchange Version 1.2, which will start shipping March 30 at a cost of $695. Current users can request the utility at no charge.

Separately, Enable Software released a gateway between Higgins E-mail products and the Message Handling System (MHS) supported by a growing number of products, including Novell, Inc.'s NetWare. The new gateway, **Higgins To:MHS,** allows users of any E-mail MHS to communicate with Higgins users. Higgins had already offered gateways to IBM's Professional Office System and Systems Network Architecture Distribution Services, as well as 3Com Corp.'s 3+Mail.

Higgins To:MHS is available now at a cost of $495.

For more information, contact Enable Software at 1105 Marina Village Pkwy., Suite 101, Alameda, Calif. 94501; (415) 865-9805.

Wellfleet Communications, Inc. recently announced software enhancements that add support of Novell, Inc.'s Internetwork Packet Exchange (IPX) and Xerox Corp.'s Xerox Network Systems transport protocols to its internetworking routers.

Together, IPX and XNS account for most of the personal computer local-area networks that have been installed to date. They join the Transmission Control Protocol/Internet Protocol, DECnet and Spanning Tree Bridge protocols Wellfleet already supported.

Available as a software upgrade for Wellfleet's Feeder Node, Link Node and Concentrator Node hardware, the XNS and IPX protocols cost $1,000.

For more information, contact Wellfleet Communications at 12 DeAngelo Drive, Bedford, Mass. 01730; (617) 275-5001.

D-Link Systems, Inc. recently began shipping software that enables workstation users on Novell, Inc. NetWare local-area networks to access the local resources of other NetWare workstations, assuming appropriate access rights. For example, **LANsmart/NV** makes it possible to share hard disks, CDROM drives, printers, plotters, modems or even entire computers.

The software is menu-driven, runs in as few as 2,000 bytes of memory and requires no additional hardware. It is priced at $995 per server.

For more information, contact D-Link Systems at 5 Musick Drive, Irvine, Calif. 92718; (714) 455-1688.

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MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USERS GROUPS AND ASSOCIATIONS

Worth Noting

"There is no problem finding people to service old systems. For every eager young techie looking to jump on the new technologies, there are three [veterans] nearing retirement who know certain systems like they know their own homes."

George Taylor Jr.
Chairman and
chief executive officer
Farmstead Telephone Group, Inc.
Glastonbury, Conn.

Association Watch

The **Unix Systems Information Networking Group (USING)** will hold its third annual conference March 26 to 28 at the Hyatt Regency Hotel in Dallas.

This year's USING Workshop will focus on networking and connectivity of Unix-based systems, with hardware and software vendors exhibiting telecommunications products that tie Unix networks together.

The cost for the three-day conference is $175 for members and $225 for nonmembers. For attendance information, call (312) 897-2323.

The **NEAX2400 User Group** will hold its eighth annual conference for users of the NEC America, Inc. private branch exchange from April 2 to 4 at the Atlanta Airport Hilton.

Seminars offered at the conference highlight network integration and net management through the NEAX2400 PBX.

Registration for those who sign up before March 16 is $225 for members and $400 for nonmembers. Registration after that date costs $350 for members and $500 for nonmembers. For more information, call (803) 798-4800. ◘

Companies benefit from tailored use of technology

Survey finds telecom services offer strategic edge.

By Joe Panepinto
Staff Writer

BOSTON — Savvy net managers are beginning to leverage diverse telecommunications technologies to improve marketing, sales and service in a broad mix of companies, according to a study released last week.

Network managers are just starting to hit their stride in the search for the individually tailored, strategic benefits of such standard technologies as inbound 800 calling, voice response systems, automatic call distributors (ACD) and mobile communications systems, according to the study conducted by The Yankee Group, based here.

In addition to decreasing operating costs while improving customer service, telecommunications technologies offer companies the opportunity to move products to market more quickly, giving them a strategic advantage over companies that rely on more conventional methods.

And as consumers grow more familiar with telecommunications technologies and become more comfortable using them, network managers are getting more aggressive in their implementation.

"None of these technologies is leading-edge by our standards," said Mark Brandstein, director of telecommunications research and consulting at the Yankee Group, "but some of these industries have never used them."

The study details seven case studies of companies gaining competitive advantages through telecommunications technology. Each offered automated alternatives and enhancements to direct person-to-person customer service.

Lotus Development Corp. in Cambridge, Mass., for instance, improved customer service by routing incoming service calls more efficiently through an ACD.

Each software package sold by Lotus comes with a product support identification number that is stored in the company's VAX mainframe along with information about the person or company that purchased it.

When customers call with questions about service on the product, they can input the product identification number via a telephone keypad and be routed

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GUIDELINES

BY ERIC SCHMALL

Appearance may be secret to net manager's success

A telecommunications manager's appearance has a lot to do with his or her success. Say what you will about competence, hard work and technical expertise, if managers dress poorly, or move or project themselves as failures, they will be treated as failures.

This has implications not only for a manager's career but also for the whole department. As telecommunications managers find themselves interacting with senior staffers more often, they project either a favorable or unfavorable image of the whole telecommunications division.

At the top of the list of critical appearance factors is the question of size. While there's nothing that can be done about height, our culture constantly reminds us about the drawbacks of being overweight.

Aside from the health problems that may stem from being overweight, there is evidence that suggests a weight problem may block a manager's career path as well.

A 1987 University of Pittsburgh study of 850 male MBA graduates indicated that those who were 20% over their ideal weight earned approximately $400 less annually than their average-weight peers. The survey also looked at 350 female MBA graduates and found so few who were overweight that the

(continued on page 24)

Schmall is a network systems manager for an insurance holding company.

Six steps to EDI

Epson America's approach to implementing electronic data interchange.

1. **Senior executive support** — Gain the commitment of top management to explore the strategic potential of EDI.
2. **Education** — Provide initial and continuing training to senior executives and departmental managers about the strategic advantages of EDI and its technical components.
3. **Situational analysis** — Evaluate current trends in EDI, trading partner readiness and the potential benefits and obstacles of implementing EDI in each department.
4. **Strategic planning** — Establish a steering committee composed of managers from every department to develop a strategic EDI plan and oversee implementation.
5. **Pilot implementation** — Establish an EDI pilot in a single department to test the effectiveness of the EDI strategy and become familiar with EDI operations.
6. **Post-pilot expansion** — Expand the EDI pilot into other departments or expand the number of trading partners or EDI transactions sets being used.

GRAPHIC BY SUSAN SLATER

SOURCE: EPSON AMERICA, INC., TORRANCE, CALIF.

Epson makes united commitment to EDI

Catalyst group convinces executives, department managers to support corporatewide use of EDI.

By Wayne Eckerson
Senior Writer

TORRANCE, Calif. — Not many companies have the foresight or the luxury to implement electronic data interchange through a coordinated, companywide approach that links EDI directly to internal applications. Epson America, Inc. is an exception.

With the blessing and encouragement of top management, departmental managers at Epson are now putting together a strategic plan that will make EDI a critical component of the way all Epson departments receive from and disseminate information to internal contacts and external customers.

"We decided the only smart way to introduce EDI was from a strategic, companywide perspective," said Gene Kunde, executive vice-president and general manager of the company.

Unlike Epson, most companies implement EDI in an uncoordinated piecemeal fashion, according to Roger Cadaret, EDI consultant at Ernst & Young in Detroit, Mich. Cadaret has conducted several training sessions on EDI for Epson. He said most firms usually have a few departments running separate — and many times incompatible — EDI pilots that cannot easily be reconciled at a later date, he said.

Six-step approach

Epson is currently halfway through a six-step EDI implementation process devised by Dean Sueda, Epson's internal audit manager; Craig Hagopian, special assistant to the vice-president of administration; Robert Long, director of logistic services; and Rob Hillseth, manager of computer operations (see graphic, this page).

During the past nine months, the company has gained top management support, provided upfront education to departmental managers who are key to making the program work and devised a situational analysis that lays out the pros and cons of EDI.

(L. to r.): Epson's Gene Kunde, Dean Sueda, Robert Long and Rob Hillseth.

Epson is now in the midst of assembling a strategic plan that will serve as the blueprint to implement EDI. From there, it will schedule pilot testing and eventually initiate a postpilot program expansion.

Last month, Epson formed an EDI steering committee consisting of 12 departmental managers who will be responsible for planning and directing the implementation of EDI within the company.

"Now is when the rubber real-

(continued on page 24)

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See the FAXNeT Form on Page #57

Appearance may be secret to success

continued from page 21

researchers concluded that these females tend to be blocked from entry-level management positions.

The next crucial factor in appearance concerns clothing. Clothes not only make the man or woman, they make the manager. While not every organization requires that the managerial ranks wear dark suits, there are often clear yet unspoken rules about what kind of attire is expected.

Many managers, having risen from the technical ranks, feel quite comfortable with their old clothing habits. More often than not, they worked in a shirtsleeve environment requiring lots of hands-on involvement with hardware. But advancement to the management level means a change in roles, often involving presentations and contacts with the organization's hierarchy. To be accepted, the manager has to adapt his clothing style.

Without becoming a slave to corporate fashion, a reasonably intelligent manager should be able to perceive the patterns that govern the dress code. It may mean the manager only has to make minor adjustments to blend in.

> Clothes not only make the man or woman, they make the manager.
>
> ▲▲▲

The last important appearance factor is what your parents call posture and the military calls bearing. It represents one of the most powerful nonverbal statements a person makes to the world.

No one can mistake the stance or gait of someone with low self-esteem. Such a person can even project this image while sitting down. People are often unaware of the message their body broadcasts, and yet it can usually be corrected with a conscious effort.

On a final note, managers should never mistake form for substance in this industry. Appearances should never be considered substitutes for competence and talent. Yet, even so, appearance can play a powerful role in blocking an otherwise promising career path as telecommunications rises in organizational importance. ▣

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Epson makes united commitment to EDI

continued from page 21

ly hits the road," Sueda said. "We've done the preliminary groundwork. Now we have to make it happen."

Epson has already laid a strong foundation with key people in the organization who are committed to seeing the EDI program work. "They realize the potential EDI has to improve operational efficiency and customer service," Kunde said.

Epson managers sowed the seeds for the EDI program with top management, and that move has turned out to be a key stroke in making the program successful, Hagopian said. Upper management bought into the EDI concept because they thought the technology could help Epson fulfill its business strategy of getting closer to its customers, he added.

The commitment by senior executives reverberated throughout the company and gave strong impetus for departmental managers to get involved with EDI, Hagopian said. The initial training sessions drew more than 65 managers from all departments.

"The word was out that the top VPs were behind this program," Hagopian said.

Besides securing top management commitment, getting departmental managers involved in the planning process is an essential step in making a strategic EDI implementation succeed, Long said. In Epson's case, departmental managers took ownership of the program by incorporating their own ideas and needs into the strategic plan.

The project wouldn't work if the systems department imposed its solution on end users, Long said, because departmental managers know better what information these users need and in what format they need it.

In one of the final training sessions, managers drew up a list of benefits and obstacles to implementing EDI in their departments and how EDI might affect their relationships with trading partners. They also prioritized the EDI applications they wanted to implement based on the benefits each application would bring their department, Long said.

According to Long, one of the things the steering committee will do is devise an EDI data dictionary that will define standard data elements, or data base fields, that every department in the company will use in its applications. This will create a pipeline that allows EDI information to flow in real time from one application to another, he said. ▣

Worth Noting

> "Competition [is] a trade-off between the loss of economy of scale and the efficiency gains because of pressure to serve users better. We have to be careful in balancing those."

Bryan Carsberg
Director general
U.K.'s Office of
Telecommunications
London

World News

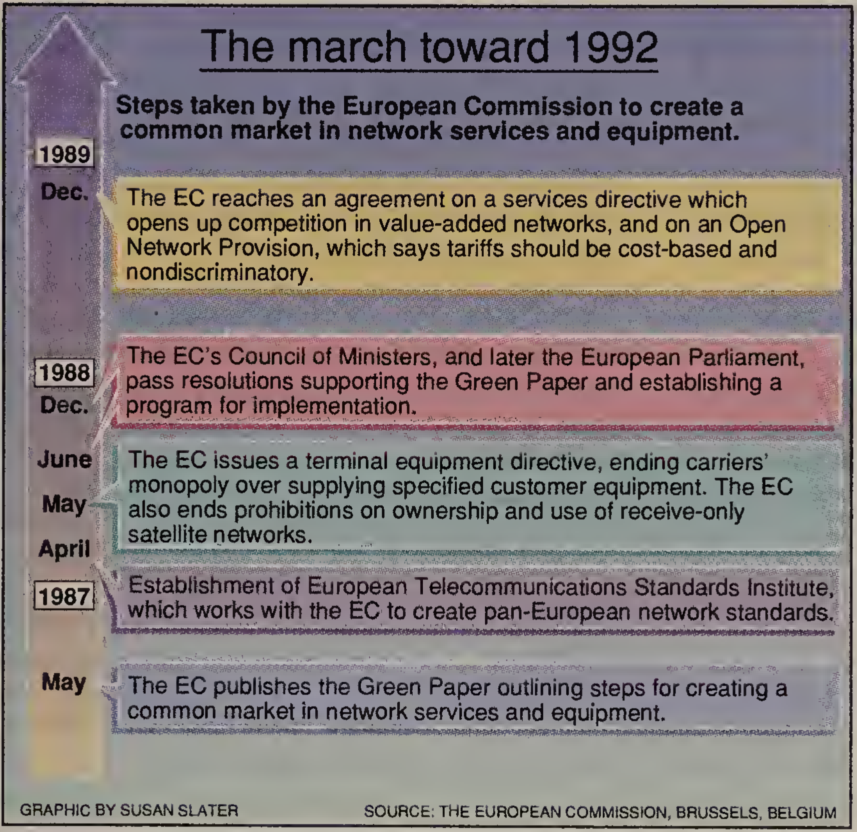
NIF, the exclusive CompuServe, Inc. licensee in Japan, granted **Taiwan Telecommunications Network Services Co. (TTN)** an exclusive license to distribute the CompuServe Information Service (CIS) in Taiwan.

The CIS offers a wide range of general information services to personal computer users, including news and home shopping.

TTN will market the English-language CIS and NIF's NIFTY-Serve on-line information services in Japanese, while developing its own Taiwanese equivalent using CompuServe and NIF technology.

The **Universal Data Systems, Inc. (UDS)** V.32 modem is the first 9.6K bit/sec modem using the CCITT V.32 transmission protocol made in the U.S. to be approved for use in West Germany by Deutsche Bundespost, the West German post, telegraph and telephone administration. UDS of Huntsville, Ala., developed the modem, which can operate at speeds of 9.6K, 4.8K, 2,400, 1,200 and 300 bit/sec using the CCITT V.32, V.22bis or V.21 transmission protocols, depending on the data circuit. UDS is a division of Motorola, Inc.'s Information Systems Group.

The modem, dubbed **MicroLink 9624**, is available immediately at a cost of 5,095 DM, or about $3,000 U.S. dollars. ◼



The march toward 1992

Steps taken by the European Commission to create a common market in network services and equipment.

1989 Dec. — The EC reaches an agreement on a services directive which opens up competition in value-added networks, and on an Open Network Provision, which says tariffs should be cost-based and nondiscriminatory.

1988 Dec. — The EC's Council of Ministers, and later the European Parliament, pass resolutions supporting the Green Paper and establishing a program for implementation.

June, May — The EC issues a terminal equipment directive, ending carriers' monopoly over supplying specified customer equipment. The EC also ends prohibitions on ownership and use of receive-only satellite networks.

April — Establishment of European Telecommunications Standards Institute, which works with the EC to create pan-European network standards.

1987 May — The EC publishes the Green Paper outlining steps for creating a common market in network services and equipment.

GRAPHIC BY SUSAN SLATER

SOURCE: THE EUROPEAN COMMISSION, BRUSSELS, BELGIUM

British communications regulator discusses policy

Shares thoughts on price caps, competition.

Although the U.K. permits only two long-distance carriers to operate within its borders, the country has adopted many other progressive stances on telecommunications regulation.

Unlike the U.S., the U.K. lets cable television companies provide switched telephone services, does not restrict carriers from publishing information electronically and has preceded the U.S. by at least five years in the adoption of price cap regulation.

Senior Editor Barton Crockett discussed these issues and a major upcoming U.K. communications policy review with the country's chief regulator, Bryan Carsberg, at the International Communications Association's World Communications Seminar in Brussels, Belgium.

Formerly a professor at the London School of Economics, Carsberg now serves as director general of the U.K.'s Office of Telecommunications, the equivalent of the U.S. Federal Communications Commission.

How has the U.K. gone about implementing competition and how have users benefited?

Our approach has been to do it as part of a transitional regime. Perhaps we've gone furthest in the mobile [communications] area because we now have five licensees. We just have a duopoly in [long-distance service, where Mercury Communications, Ltd. has been authorized to compete with British Telecommunications PLC for switched and private-line services]. Users have benefited by seeing better service and an average reduction in [switched] prices approaching 33%.

But haven't prices for private lines increased?

Yes. But we published a report last year that shows that U.K. prices for private lines still compare favorably to most other countries. They're certainly comparable to [those in] the U.S.

Why have private-line prices increased?

In the past, prices on private lines were held down because of political pressure. What happened was that a political decision was made to hold down the price of local calls in order to help domestic customers. And that meant the price of long-distance calls had to be kept up, and that's bad for business.

So the political decision at that time was to hold down the price of private circuits as compensation. I think that's a very good example of the kind of distortion that creeps in from political interference in this business.

What has been your experience with price caps?

We think that price caps have been successful, although when you make statements like that, you don't really know in any scientific sense. I think perhaps the best evidence I can adduce for saying that is when we reviewed the regime in 1988, there

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Carrier competition takes root in Japan

The lower rates offered by two new rivals lure customers away from Kokusai Denshin Denwa.

By Lori Valigra
IDG News Service Asian Bureau

TOKYO — Services offered by Japan's two new international carriers may be difficult to tell apart, but the 7% savings over former monopoly Kokusai Denshin Denwa, Ltd. (KDD) has given customers here their first taste of the benefits of competition.

The two new challengers to KDD — International Digital Communications, Inc. (IDC) and International Telecom Japan, Inc. (ITJ) — have been offering international leased lines since May and switched services since last October.

A month after the companies introduced their services, which were roughly 23% less expensive than the monopoly carrier's services from Japan to the U.S., KDD cut its rates 17%, narrowing the price difference between carriers to 7%.

"For the user, even though the tariff difference ended up not being as wide as was initially thought, there is competition, and users can enjoy low tariff rates," said Nobuo Ito, executive vice-president of ITJ.

ITJ is a consortium owned by 137 shareholders and led by seven companies, including British Telecommunications PLC, Mitsubishi Corp. and Mitsui & Co., Ltd. The group has invested $71.43 million in the carrier.

Competition has already resulted in one milestone. "On Oct. 1, for the first time, the rates from Japan to the United States were lower than the other way around. We are very proud of that," Ito said. Now ITJ's major objective is to get as many customers from KDD as possible.

KDD customer defections are already afoot. KDD President Takazo Ishii said recently that the carrier lost 25% of its U.S.-bound traffic to competitors between September 1989 — just before the two opponents started service — and December 1989.

Apparently, even 7% savings are great enough to draw customer attention, especially for high-volume users.

Kiyofumi Suzuki, a senior manager in the electronics and information systems division of Nippon Steel Corp., said his firm switched to IDC to save money.

Although Nippon Steel owns about 2% of IDC, Suzuki said the company shifted because IDC offers competitive rates. "The switch was for our usual business

(continued on page 26)

Decision may retard pace of competition in Europe

By Barton Crockett
Senior Editor

BRUSSELS, Belgium — The Advocate General for the European Commission's (EC) Court of Justice recently issued an opinion that could slow down the implementation of reforms meant to open up European net markets.

The Advocate General, whose advice the court generally follows, sided with four Common Market countries in concluding that a legal tactic the EC used to implement directives to open up terminal equipment markets was improper. This same tactic was used by the EC to push through a recent agreement opening up value-added network markets.

As a result, the EC likely will be required to find a new way to achieve these initiatives, which could slow the pace of regulatory reform in Europe.

"It could create a credibility problem, which could cause some confusion in the marketplace," said Herbert Ungerer, head of the EC's Telecommunications Regulatory and Policy Division.

The dispute surrounds the EC's use of Article 90 of the Treaty of Rome, which sets the basic legal framework for the Common Market. Article 90 allows the EC to force countries to adopt reforms if they are deemed to be engaging in anticompetitive practices. Article 90 has been used predominantly to force a single country to adopt reforms. The EC's telecommunications regulators, however, tried to use Article 90 to force reforms on the entire Common Market.

France, West Germany, Italy and Belgium argued before the EC's Court of Justice that using this tactic in the terminal equipment directive was improper. The

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Carrier competition takes root in Japan

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activities, not because we own part of the company. It was to save money."

Although they are making inroads, the newcomers still have limited geographical coverage, and the services they offer are limited. They do not offer operator assisted calls, and they are not in a position, as is KDD, to offer special offers to lure big customers. KDD, for example, offers a service called "Route KDD" that gives users a 15% savings over conventional rates.

KDD also plans to provide service to 216 worldwide locations, 180 of which are international direct-dial locations. This compares to the handful of countries serviced by the new firms.

But despite its current dominance, KDD is not taking the new competition lightly. According to Gen Sasaki, deputy director of the service development and coordination department at KDD, the carrier is preparing to file for another price cut with the Ministry of Posts and Telecommunications, which regulates the industry. Sasaki added, however, that prolonged price cuts are dangerous, cutting into network investments.

In terms of service demand, the need for service is, in many cases, threatening supply. The three companies already face limited line capacity in the Pacific region, one of the fastest growing areas for telecommunications traffic in the world.

Capacity on the Trans Pacific Cable (TPC)-4, scheduled to be cut over in October 1992, was sold out last spring, Ito said.

ITJ bought into TPC-3/Hawaii-4 (Haw-4) fiber-optic cables between the U.S. and Japan, uses International Telecommunications Satellite Organization earth stations over both the Pacific and Indian oceans and plans to buy additional cable capacity in the future. It has invested $214.29 million so far to set up its own all-digital network. Ito said the firm needs 10% to 15% market share to recoup its investment.

IDC, a consortium of 144 companies headed by C. Itoh & Co., Ltd., Cable & Wireless PLC, Pacific Telesis International and Toyota Motor Corp., plans to install its own fiber cables.

The company, under strong direction by Cable & Wireless and with a total shareholder investment of roughly $114 million, plans to lay two fiber-optic cables. The first is the North Pacific Cable (NPC) running from Japan to the U.S., which will have 1,260M bit/sec of capacity and is scheduled to be cut over in December.

Kenji Tomikawa, manager of the planning department at IDC, said the cable will cost $285 million, half of which will be paid by Pacific Telecom Cable. The other half will be divided, with 70% to be paid by IDC and 30% by Cable & Wireless.

The other cable is the Asia Pacific Cable (ASPAC), which will stretch from Japan to Singapore and may have extensions to Hong Kong and Shanghai, China. It should be ready for service at the end of 1992 or mid-1993. The investment is $260 million. IDC also has bought into TPC-3, Haw-4 and other cables. Its network, like ITJ's, is all-digital.

NPC will be the first fiber-optic submarine cable to directly link Japan and the U.S. mainland. A 8,380 km line, it will also offer 1,260M bit/sec in capacity, supporting the equivalent of 17,010 64K bit/sec voice conversations.

Compared to the volatile market for switched service, the leased circuit business is still small but stable. Services and prices offered by the three firms are similar.

Leased circuit rates on the Japanese side of international circuits range from $3,571 per month for a 9.6K bit/sec digital line to $54,000 per month for 2M bit/sec E-1 (the European equivalent of T-1) lines. A T-1 line costs $46,643 per month.

By comparison, KDD's prices range from $3,786 per month for a 9.6K bit/sec circuit to $58,000 for E-1. T-1 links cost $50,143 per month.

IDC and ITJ each have about 100 leased-line customers. "Leased circuits are a very important market for the future," Ito said. "But leased circuits are always vulnerable to technical problems, and we must trace these because these customers are very demanding. So ITJ, having invested 30 billion yen, is more anxious to get a substantial share in the switched telephone business."

Decision may retard pace of competition

continued from page 25

court's Advocate General agreed. While a decision won't be made for another two months or so, the Court of Justice generally follows the Advocate General's advice.

This means that the EC's terminal equipment and services directives will have to be revamped, a process which can't begin until the Court of Justice issues its opinion, which could take months.

Despite the setback, Ungerer insisted the impact on users will be minimal. "Most countries have already adopted these reforms or are about to do so," he said. "These legal issues will not change that."

Ungerer added that the countries that filed the objection did so only on legal grounds. He said these countries already have agreed to implement the forms laid out in the EC's directives.

Ungerer admitted, however, that the legal dispute could slow the implementation of reforms among countries that have not already fallen in line with the EC initiatives. These are predominantly countries with weaker network infrastructures, such as Italy and Portugal.

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PRODUCTS & SERVICES

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First Look

Multi-Tech unwraps 3780 BSC package

Multi-Tech Systems, Inc. recently introduced a 3780 Binary Synchronous Communications package consisting of an IBM Personal Computer adapter card and software.

MultiCom3780/BSC emulates IBM 2770, 2780, 3741 and 3780 terminals for communications over dial-up or leased lines with IBM mainframes or other BSC devices, including IBM System/3X minicomputers and Digital Equipment Corp. PDP-11 and VAX minicomputers.

The product is intended for 3780 Remote Job Entry batch communications, electronic data interchange and Internal Revenue Service electronic income tax filing applications, the company said.

The card has an RS-232 port for connection to a 2,400, 4.8K or 9.6K bit/sec synchronous modem.

MultiCom3780/BSC communicates in half-duplex mode and will not operate over multipoint, polled networks.

MultiCom3780/BSC costs $899 and is available now.

Multi-Tech Systems, Inc., 2205 Woodale Drive, Mounds View, Minn. 55112; (612) 785-3500.

Kodiak releases trio of E-net boards

Start-up **Kodiak Technology** recently announced two Ethernet adapter boards, a four-channel Ethernet adapter and diagnostic software for the adapters.

All of the products are for use in Novell, Inc. NetWare local-area networks.

The two new Ethernet adapters are **Raven-8** and **Raven-16.** Raven-8 is a half-size card designed for IBM Personal Computer XTs, Personal Computer ATs and Personal System/2s. Raven-16 is a 16-bit bus interface for more high-performance personal computers such as Intel Corp. 80386-based file servers. Both adapters come with 64K bytes of random-access memory, which is eight times more than typical Ethernet cards, according to Sam Brown, the company's president. This increase allows a greater

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SMC introduces four-port EISA-based Arcnet interface

Firm also releases its first intelligent Arcnet hub.

By Tom Smith
New Products Editor

HAUPPAUGE, N.Y. — Standard Microsystems Corp. (SMC) recently introduced a four-port Arcnet interface card for Extended Industry Standard Architecture (EISA) bus microcomputers.

SMC also unveiled its first intelligent Arcnet hub, which disables failed nodes to prevent them from shutting down an entire network.

The new interface, Arcnet-EISA3200, can be used to connect a single EISA-based server to multiple Arcnet subnetworks, eliminating the need for a separate interface card to support each subnet. Arcnet-EISA3200 can also be used to connect file servers by providing four 2.5M bit/sec Arcnet connections from a single card.

Designed for use in Novell, Inc. NetWare local-area networks, Arcnet-EISA3200 comes in versions that support twisted-pair or coaxial cable connections that have 2,000- and 400-foot distance limitations, respectively. Those distance limitations are Arcnet standards.

The Intel Corp. 80188-based card uses bus mastering, a technique in which the board seizes control of the microcomputer's bus for uninterrupted data transfer between the Arcnet adapter and the computer's memory.

Arcnet-EISA3200 overcomes limitations inherent in using single-channel Arcnet cards to connect subnets on large LANs, according to Geof Karlin, director of marketing.

Single-channel cards use up scarce resources because they require an interface slot for every LAN segment, whereas Arcnet-EISA3200 packs the equivalent of four interfaces into a single card.

In addition, Arcnet-EISA3200 can bridge Arcnet subnets at the NetWare driver software level. Typical single-slot cards, by contrast, perform this function at a much higher level, NetWare's Integrated Packet Exchange (IPX) transport level, Karlin said. The latter approach introduces more overhead and decreases performance, he added.

More bandwidth per adapter

The Arcnet-EISA3200 can also be used to provide an aggregate of 10M bit/sec bandwidth between two file servers or between

(continued on page 28)

CASE/Datatel announces low-end T-1 multiplexer

CHERRY HILL, N.J. — CASE/Datatel, Inc. recently introduced a low-end multiplexer that supports up to 60 data channels, 24 voice channels or a mixture of both over a single T-1 line.

The DCP9401 T-1 Network Access Multiplexer complements CASE/Datatel's existing high-end Nodal Processor 24-slot multiplexers, which support multiple T-1 lines and as many as 96 voice or data channels over a single T-1 trunk.

The time-division multiplexer, based on a Rockwell International Corp. 6502 microprocessor, combines voice and data traffic over a single T-1, fractional T-1 or switched 56K bit/sec line.

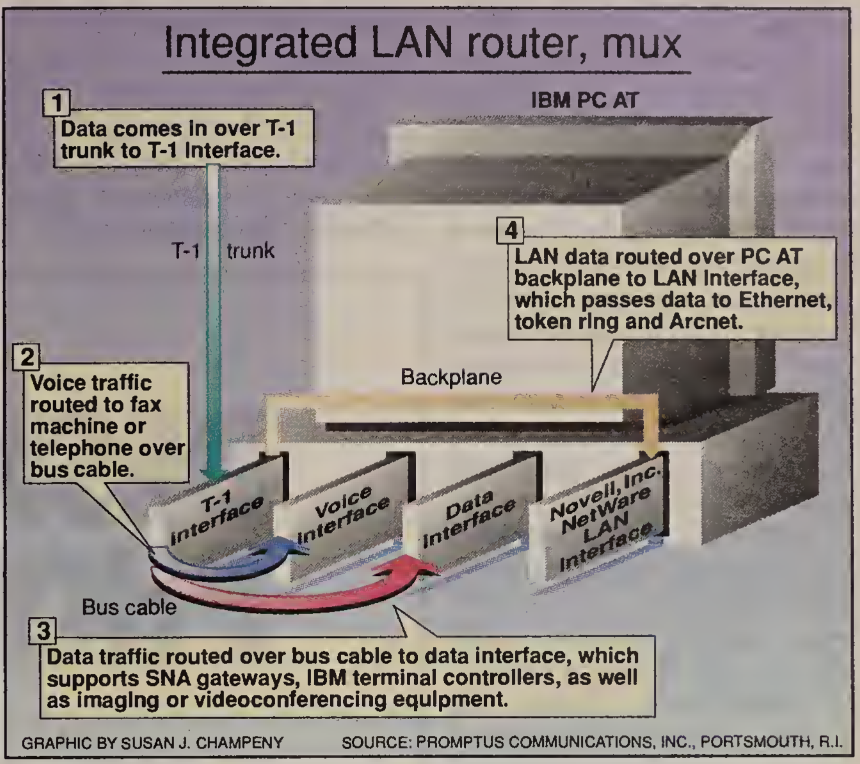
Data interfaces, supporting speeds from 50 bit/sec to T-1, come in five-port versions, while voice interfaces come in four-port models. Previously, data and voice cards supported two and four ports, respectively. This allows users to have more ports in a given amount of space. The enclosure is roughly half the size of its high-end model.

The new multiplexer is CASE/Datatel's first to offer an optional integrated channel service unit (CSU) for direct connection to a T-1 line. It is not needed, however, for users that have a CSU.

A new subrate data multiplexing interface supports five synchronous links at speeds ranging from 2,400 to 19.2K bit/sec. Subrate data multiplexing enables users to perform single-ended multiplexing, in which a subrate data multiplexing card is used to establish connections with multiple low-speed digital data service lines through a digital access and cross-connect system.

Another interface is the DS1 access interface, which enables the DCP9401 to be used in drop-and-insert configurations with a digital private branch exchange. In such a setup, a T-1 trunk from the PBX terminates in the DCP9401. The multiplexer will use available DS0s for data or voice traffic to maximize band-

(continued on page 29)



Integrated LAN router, mux

1 Data comes in over T-1 trunk to T-1 interface.

2 Voice traffic routed to fax machine or telephone over bus cable.

3 Data traffic routed over bus cable to data interface, which supports SNA gateways, IBM terminal controllers, as well as imaging or videoconferencing equipment.

4 LAN data routed over PC AT backplane to LAN interface, which passes data to Ethernet, token ring and Arcnet.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: PROMPTUS COMMUNICATIONS, INC., PORTSMOUTH, R.I.

Promptus offering acts as router, mux

Dual functionality offered in PC AT platform will reduce network costs and simplify management.

By Tom Smith
New Products Editor

PORTSMOUTH, R.I. — Promptus Communications, Inc. recently introduced a product that performs voice/data multiplexing, as well as local-area network routing.

The Promptus T-1 CommServer+ consists of an IBM Personal Computer AT and several plug-in interface boards. The product separates incoming voice, data and LAN traffic and passes each to its respective voice, data or LAN interface residing in the unit.

In routing mode, the T-1 CommServer+ transmits data among Ethernet, token-ring and Arcnet LANs running Novell, Inc.'s NetWare network operating system.

The product packages multiplexing and LAN routing into a single device, which reduces costs and simplifies data management, the company said.

Promptus also introduced a LAN router based on the T-1 CommServer+ that routes data from remote NetWare LANs over a T-1 line to other Ethernet, token-ring or Arcnet NetWare LANs. The company will market that product as the T-1 LanRouter.

Future lies in the cards

At the heart of the T-1 CommServer+ is its T-1 interface board, which performs multiplexing of voice and data channels and supports X.25 for routing LAN data at the network layer of the Open Systems Interconnection model.

The Intel Corp. 80186-based T-1 interface comes in three versions: with an integrated channel service unit (CSU) for direct connection to a T-1 line; without a CSU, requiring a multiplexer; and supporting direct ties to a 2.048M bit/sec European T-1 line.

The version with the integrated CSU supports T-1 framing formats, including D4 and the more sophisticated extended superframe format, which provides statistics on the T-1 trunk. It also supports the digital access and cross-connect system, the ability to switch individual DS0s within a T-1 trunk.

The company claims to offer the first router with an integrated CSU, which saves users the cost that otherwise would be incurred for that hardware.

The T-1 interface card supports the Integrated Services Digital Network Primary Rate Interface (PRI), which divides the capacity of a T-1 line into 23 64K bit/sec bearer channels and one 64K bit/sec signaling channel. To implement PRI, users must purchase optional software that will be available at a later date.

The T-1 CommServer+ also supports a variety of voice interface cards, which each come equipped with four RJ-11 ports that support analog telephones, facsimile machines or private branch exchange trunks. The cards also support 64K bit/sec pulse code modulation.

In addition, data can be switched from an incoming T-1 line to two-port synchronous data cards that offer users a

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First Look

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amount of data to be transmitted with a single interrupt, resulting in higher performance.

The four-channel card, the **Raven-Four,** supports four separate thin-wire Ethernet channels and, therefore, connection to four LANs. The card is intended for users that want to segment large networks for performance considerations or for connecting multiple networks with a single card. It has drivers for NetWare 286, which supports up to four LANs, or NetWare 386, which supports up to 16 LANs and, therefore, four cards.

The card's four independent Ethernet channels each have 64K bytes of RAM for a total of 256K bytes. All three of the new cards can be controlled using diagnostic software called Chknet. This software is used to set interrupts and the I/O address for the LAN card and to perform loop-back tests for the entire Ethernet LAN.

The Raven-8 and Raven-16 cards are available now for $292 and $354, respectively. Raven-Four will be available in March for $1,690. Chknet software will cost $450 but is available free with each Raven card through the end of March.

Kodiak Technology, 2340 Harris Way, San Jose, Calif. 95131; (408) 954-8070.

3270 terminal-emulation pack supports Windows

Attachmate Corp. last week announced IBM 3270 terminal-emulation software that supports Microsoft Corp.'s Microsoft Windows graphical user interface.

Extra! for Windows is software that resides on a Personal Computer AT, XT or Personal System/2 and performs 3270 terminal-emulation and file-transfer functions. A key feature of the software is its user interface, which is based on pull-down menus with icons and multiple windows controlled by a mouse.

The software works in conjunction with all existing 3270 terminal-emulation boards.

Extra! for Windows supports up to 26 simultaneous IBM host sessions, each in a separate window that can be moved, sized or identified with an icon. It also supports macrocommands, a series of keystrokes recorded as a single keystroke to automate commonly used procedures.

File transfer using IBM host-based IND$FILE software can occur in background mode while users run DOS or Microsoft Windows applications in the foreground.

The software can transfer 2,000-, 4K-, 8K- and 32K-byte files, unlike some existing products that can only transfer 2,000-byte files, the company said. The ability to support larger data files reduces file-transfer acknowledgment time, increasing overall transfer speeds.

The product supports Control Unit Terminal and Distributed Function Terminal modes for single and multiple host sessions, respectively.

The product is expected to be available in March for $425.

Attachmate Corp., 13231 S.E. 36th St., Bellevue, Wash. 98006; (206) 644-4010. ◼

SMC introduces Arcnet interface

continued from page 27

a file server and an EISA workstation. With Arcnet-EISA3200 interfaces in each workstation, the Arcnet backbone can support four 2.5M bit/sec channels between the servers.

Some users link Arcnet file servers over an Ethernet backbone, but Arcnet-EISA3200 will provide the same bandwidth, the same functionality and, Karlin claimed, 20% to 30% better performance over an Arcnet backbone.

Arcnet is better suited to this application because it is designed for transaction-processing environments characterized by the short bursts of traffic that are typical in communications between file servers, Karlin said.

Ethernet, by contrast, handles larger data packets at a given time and, therefore, introduces more overhead, lowering performance.

Both versions of Arcnet-EISA3200 should be available in May for $995.

First intelligent hub

For the first time, SMC is offer-

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Meridian Digital Centrex is a trademark of Northern Telecom
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ing an intelligent hub, dubbed the Intelligent Hub with Network Management Software.

Based on an Intel 8051 microprocessor, the eight-port hub, which supports star, bus or daisy-chain configurations, monitors every port and automatically shuts down a failed node, preventing the entire network from collapsing.

DOS-based network management software bundled with the hub provides a graphical map showing configuration and status of nodes on the network. Future releases will gather statistics, such as throughput rates, as well as perform date and time stamping of alarms.

Intelligent Hub with Network Management Software is priced at $749 for a coaxial version and $895 for a twisted-pair version. It is shipping now.

At $150 more than the company's existing Hub 02 product, the Intelligent Hub with Network Management Software could replace that product, depending on customer demand, according to Karlin.

SMC can be reached by writing to 35 Marcus Blvd., Hauppauge, N.Y. 11788, or by calling (516) 273-3100. ◼

CASE/Datatel announces mux

continued from page 27

width utilization.

A switched 56K bit/sec interface that was offered with earlier multiplexers can be used to establish dial-up calls as a backup mechanism for critical channels on the DCP9401.

A variety of two- and four-wire voice interfaces offered for the DCP9401 support 64K bit/sec pulse code modulation and 32K bit/sec adaptive differential pulse code modulation.

The multiplexer can be managed from an ASCII terminal attached to the DCP9401 that performs diagnostics such as bit error-rate and loop-back tests.

The DCP9401 costs $4,000 for the 12-slot enclosure. Voice and data interfaces cost $250 to $600 per channel. The multiplexer is available 45 to 60 days after receipt of order.

CASE/Datatel can be reached in writing at Cherry Hill Industrial Center, 55 Carnegie Plaza, Cherry Hill, N.J. 08003, or by calling (609) 424-4451. ◼

Offering acts as router, mux

continued from page 27

choice of RS-422 or V.35 interfaces. They support speeds up to T-1 for data communications hardware, as well as imaging and videoconferencing equipment.

The T-1 CommServer+ will support any type of LAN interface that has drivers for Novell NetWare 2.1 and above.

The T-1 interface communicates through a bus cable to the voice and data cards. For example, an incoming fax would be routed through the T-1 interface over the cable to the voice card and from there to an attached fax machine.

For LAN routing applications, the T-1 interface strips an X.25 packet from the data and routes it over the Personal Computer AT bus to the LAN card.

The T-1 CommServer+ is expected to be available in May for $7,000, which includes the computer, the T-1 interface, a monitor and keyboard. System software used for management and diagnostics costs $3,000, voice interface cards cost $1,200 each, and data interface cards cost $975 each. PRI software, which has not been priced yet, will be available in 30 to 60 days.

Router package

The new LAN router, the T-1 LanRouter, is a four-slot, downsized version of the T-1 CommServer+ that uses only the T-1 interface and the LAN card. It is also offered as a single-slot card for existing Personal Computer ATs.

Like the T-1 CommServer+, the T-1 LanRouter supports switched 56K bit/sec, fractional T-1 and T-1 services, as well as the same LANs as the T-1 CommServer+.

T-1 LanRouter should be available in April. The Personal Computer AT version costs $6,325, while the card version costs $3,950.

Promptus can be reached in writing at Portsmouth Business Park, Portsmouth, R.I. 02871, or by calling (401) 683-6100. ◼

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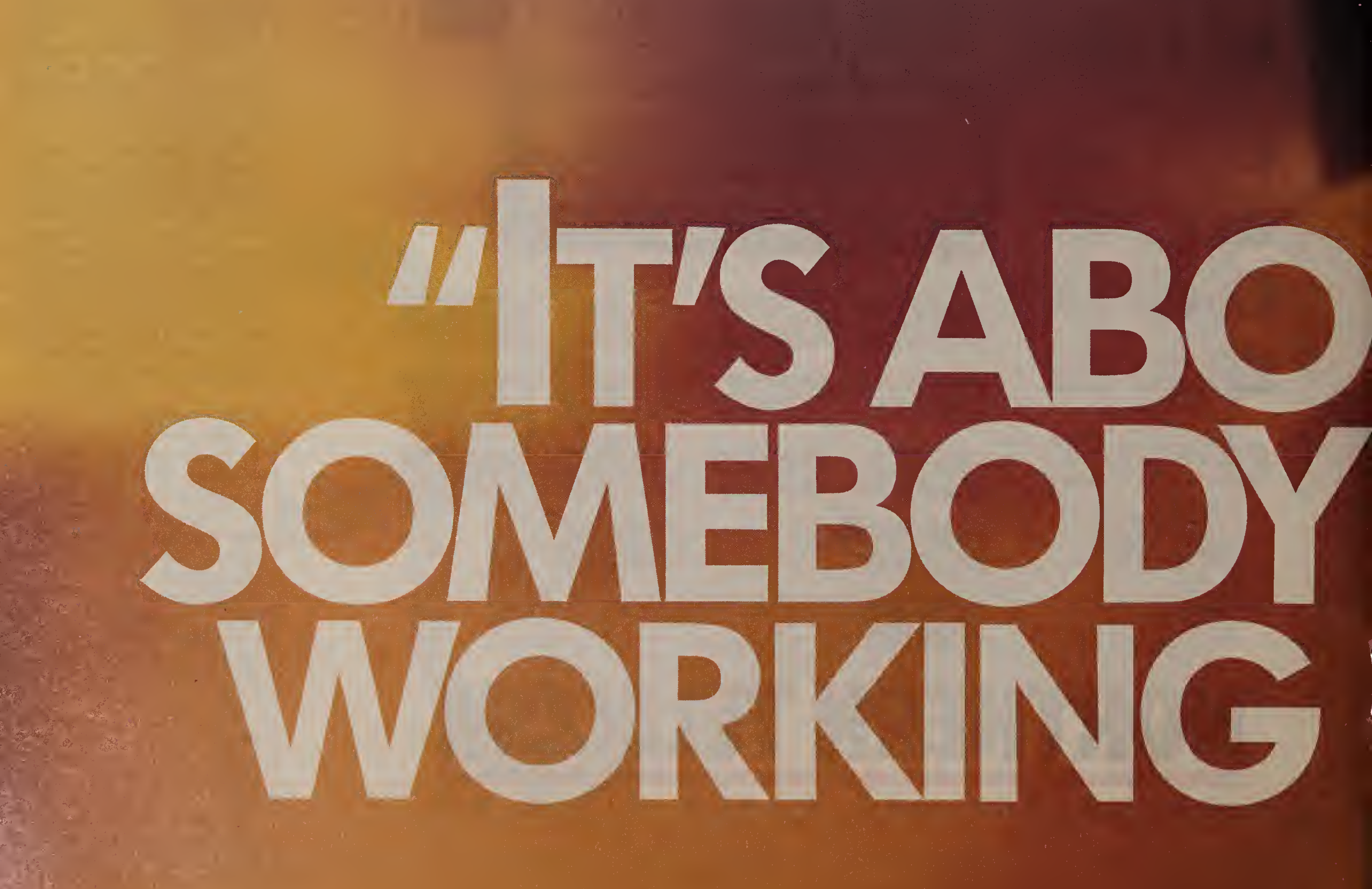

See the FAXNeT Form on Page #57

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OPINIONS

NETWORK MANAGEMENT

BY IRA HERTZOFF

Using history to solve today's problems

Reliable networks are taken for granted, but when they fail, they fail spectacularly. AT&T's recent interexchange outage proves this assertion. The outage was not related to a natural disaster or a critical component failure; it was a network control system failure. Unlike its best known predecessor, the electrical blackout of the northeastern U.S. in November 1965, this outage was resolved relatively quickly.

I once worked for one of the nation's largest power suppliers, a company whose obsession with reliability was the hallmark of its operations. The company built a super network management system using concepts that are just now being incorporated in communications networks. One was that the more you know about the network, the better you can avoid problems or respond to emergencies. The history of the company's network — which at that time covered 75 years — was contained in a treasured data base, which was used for system planning.

> Good network management systems build upon the network's history.
>
> ▲▲▲

The system planning group ran test cases against the network history, simulating outages, catastrophes and different loadings. The results were then compared to actual network events, and the techniques were refined. When computers became available, the company used them — first to simulate and then to manage the network. The real-time control of the network was automated but with a high degree of caution, as in the traditional fashion of a utility company.

The real-time system ran in parallel with programs derived from the system planning model. This state estimation system acted as a control on the network management system. Out-of-range activities predicted by the model were controlled, and missing data resulting from telemetry failure was generated by the model. The network was protected from failures of its management system, and actions out of range were rejected by comparison with recorded network history.

One thing we have learned is that interconnected networks provide great economic benefits but that some thankfully rare problems can propagate at network speed. The strengths provided by the network's management and control features can be counteracted by problems within the management and control systems.

Some networks don't have enough history to use simulation as a check on systems. Good network management systems build on the network's history and use that history for many purposes. When the full details of the AT&T outage are published, we will probably find that the speed of the resolution was due in large measure to having network history and performance data accessible and ensuring that the necessary resources were on hand. Without resources available, the best history is useless.

Network repositories are an essential tool for problem resolution, but many companies don't keep network performance history. Often, this is because network management is a relatively new discipline and the importance of history as an operational tool is not yet fully recognized. Good network management systems keep this data; better ones use it. The best make the study of it an integral part of day-to-day operations and position the resources to enable preplanning to work.

Hertzoff is president of Tholian (Holdings) Inc., a Columbus, Ohio, network management and network security consulting firm.

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Network World
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Copy Editors
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501 Second Street, Suite 600
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EDITORIAL

Help for Drexel net staff; plaudits for IBM efforts

The rapid demise of high-flying Drexel Burnham Lambert, Inc. — the Wall Street firm that engineered some of the biggest takeover deals in the buyout binge of the 1980s — presents a unique opportunity for users, particularly companies in the New York area.

Almost as quickly as word got out that Drexel had filed for protection under Chapter 11 two weeks ago, the company laid off more than 3,500 workers. Struggling under the weight of crushing debt, the company decided to disband rather than try to reorganize under bankruptcy proceedings.

As a result, some 500 seasoned information systems (IS) personnel, including network and data processing professionals with a range of experience, found themselves without jobs.

While that's bad news for the Drexel employees, it's good news for those looking for experienced personnel.

Network World will be working with laid-off staffers to help them find positions with other user companies. Some of Drexel's top IS executives will be forwarding employees' resumes to us, and we'll pass them on to any prospective employer.

The resumes are grouped according to the following job classifications: network design engineers (voice and data); network technicians and operators; market data specialists; service order writers/technicians (voice, data and market data); IBM 3270 networking specialists; local-area network designers/technicians (token ring); personal computer software support; site cabling technicians; IBM mainframe capacity planners; project analysts; project managers; application programmers (COBOL/DB2/SQL); and systems analysts.

One of the most oft-heard complaints of network managers is the difficulty of finding qualified IS personnel. Well, here's a wealth of qualified workers eagerly seeking new opportunities.

If you're looking for candidates in any of the categories listed above, please contact *NW's* Tracie Seder at (508) 875-6400 or write to *Network World* at 161 Worcester Road, Framingham, Mass. 01701.

We're happy to help Drexel's IS staffers, and we wish them the best in this trying time.

Giving credit where it's due

For a long time, IBM has been sharply criticized for giving only lip service to supporting open network standards.

But in recent weeks, IBM has made several announcements that show a real commitment to standards.

- In January, IBM said its OS/2 Extended Edition operating system will support the Transmission Control Protocol/Internet Protocol and that its Information Network will support X.25. IBM also beefed up its X.25 software for Systems Network Architecture networks.
- In an interview with *Network World* during the recent Communication Networks '90 show, IBM Vice-President Ellen Hancock said the company will ship in March its Open Systems Interconnection/Communications Subsystem, which will allow SNA and NetView to support OSI protocols. The product — which Hancock described as the cornerstone of IBM's support for OSI — is expected to ship on schedule by the end of the month.
- As part of a major workstation rollout two weeks ago, IBM unveiled a new version of AIX, its Unix implementation. The latest version provides integrated support for TCP/IP, X.25, Sun Microsystems, Inc.'s Network File System and the Network Computing System, a distributed processing system from the Apollo Systems Division of Hewlett-Packard Co.

Announcements such as these indicate that IBM is making good on its commitment to help SNA users weave other vendors' products into their network strategies. That's not only smart for IBM, but it's also good news for IBM users.

While many are quick to criticize market leaders, IBM's progress toward a more open information systems environment is something that shouldn't go unnoticed.

FUTURE NETWORKS

BY MARY JOHNSTON

Can LECs cope with challenge of next-generation nets?

The local exchange carriers face tough challenges as they get ready to take on support of next-generation networks — those that support voice, data, image and video communications at transmission rates of 100M bit/sec and higher. At a minimum, next-generation nets require ubiquitous digital switching, fiber-optic transmission and Signaling System 7 (SS7).

They also require new network topologies, such as redundant fiber rings, and new protocols, such as 802.6. The local exchange carriers are experimenting with many of these new technologies. However, technology upgrades, even if implemented on accelerated timetables, will probably not be enough to enable local exchange carriers to be successful in the next-generation net market.

The local exchange carriers also must deal with an entire range of issues that they may not be able to master easily. Specifically, these include positioning newer technologies intelligently before users, pricing new services competitively, and gaining credibility with users regarding engineering and supporting complex services.

Due to a lack of training or a lack of a clear company vision, local exchange carrier sales forces often cannot focus user decision-making on the most appropriate services. Users, particularly national accounts, have the difficult task of sorting through different technical approaches from multiple local exchange carriers, as well as long-distance carrier offerings.

To national users, the resulting analysis usually leans in favor of a single-vendor solution — an interexchange carrier — rather than relying on multiple local exchange carriers. Promises from local exchange carriers to support systems integration and service coordination across companies carry little weight without measurable track records. In essence, local exchange carrier solutions often appear uncoordinated and contradictory, while interexchange carriers offer smoother planning and operation.

This poor market perception can be attributed to several factors. First, compared with interexchange carriers, local exchange carriers have a much larger base of switching and transmission to upgrade or replace. They also face more conservative regulatory oversight than do the interexchange carriers, resulting in extended depreciation periods that can make the rapid introduction of new offerings difficult. Also, collaboration between the regional Bell holding companies and interexchange carriers on product and service planning is prohibited under current antitrust laws.

> Local exchange carriers are still trying to reinvent LANs in the image of ISDN.
>
> ▲▲▲

Local exchange carriers have yet to demonstrate an in-depth understanding of the high-end user's current local-area network-based data communications environment. They're still trying to reinvent LANs in the image of ISDN, rather than promoting complementary communications strategies that have room for both.

In addition, local exchange carriers have devoted too much effort to the development of enhanced network processing services — such as gateways and Open Network Architecture — while shortchanging enhancements to their basic transmission services. Network management for traditional services has been particularly weak.

While interexchange carriers offer Open Systems Interconnect-oriented customer-controlled access to moves, changes, billing and performance statistics, most local exchange carriers and Bell Communications Research have yet to commit to standards or to a common local exchange carrier offering.

Finally, BELLCORE, which only promotes projects that its owners — the RBHCs — care to fund, hasn't taken the lead in driving local exchange carriers toward common service offerings. Fragmented as they are, the local exchange carriers are weak competitors in the eyes of major national accounts. They are even weaker as a group when they offer widely different services that are incompatible with interexchange carrier offerings. The delay in SS7 compatibility between the interexchange and local exchange carriers is a recent example of the frustration users face.

To be strategic communications vendors in the 1990s, local exchange carriers must take a page out of the interexchange carriers' book on competition. In the last five years, AT&T, MCI Communications Corp. and US Sprint Communications Co. have gone through many changes, most of which have benefited users.

Specifically, they have recognized the importance of international OSI standards; invested extensively in the rapid deployment of fiber, digital switching, SS7 and other fundamentals; and outgrown the discounted long-distance price war in favor of developing sophisticated services and working with users on innovative applications and long-term commitments.

They've also worked hard to make their sales forces act as proactive consultants to clients, gaining insight into clients' busi-

(continued on page 42)

Johnston is a principal with Northeast Consulting Resources, Inc., a Boston-based consulting collaborative that specializes in telecommunications strategies, architectures and training for users and vendors.

IS THE PEN MIGHTIER THAN THE ROUTER? Write a column for *Network World's* Opinions pages and let us know the answer.

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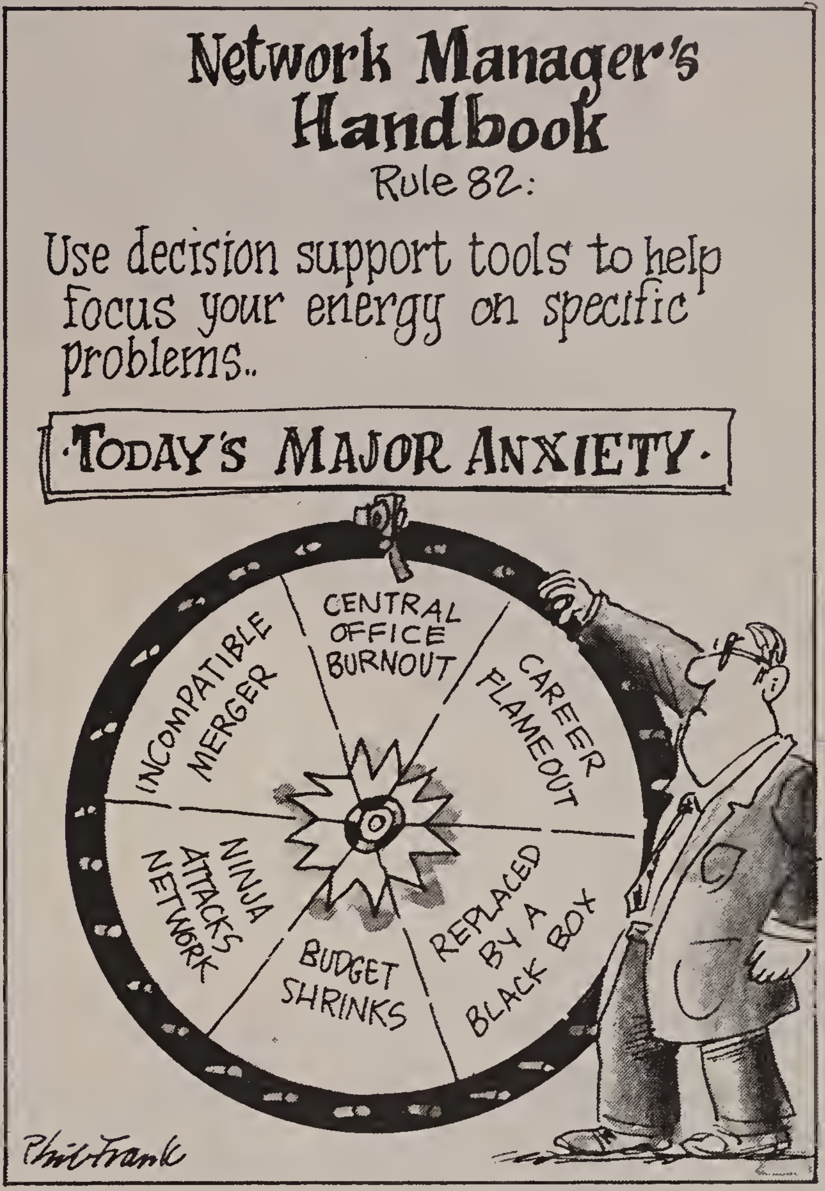
TELETOONS

BY FRANK AND TROISE



LETTERS

Exception to the rule

Part 1 of your Buyer's Guide to private-line services ("Digitization advances private-line services," *NW*, Dec. 25/Jan. 1) gave a summary of the current capabilities of T-3 multiplexers, which we believe was in error.

The article stated, "Current T-3 multiplexers, called M13s, can handle only point-to-point transmission. They cannot separate individual T-1s or any portion of a T-1 without first breaking the T-3 into the 28 T-1s that comprise the circuit."

While the statement is true for M13 multiplexers, Infotron Systems Corp.'s StreamLine 45 is a networked drop-and-insert T-3 multiplexer that can separate individual T-1s out of the T-3 signal without breaking the entire T-3 into 28 T-1s.

The article goes on to say that, in the future, "drop and insert will be possible." Readers should be aware that drop and insert is a current feature of the StreamLine 45. In fact, it is presently being used in a DS2 drop-and-insert application by several large networks, including that of US West, Inc.

Mark Luczak
Technical features editor
Infotron Systems Corp.
Cherry Hill, N.J.

Reviewing the review

I thought Eric Schmall's review of *Total Customer Service: The Ultimate Weapon* (*NW*, Jan. 15) was a fair appraisal of this entertaining book, save one thing.

Schmall's observation that the subject matter is "not directly related to telecommunications" is debatable. In fact, Chapter 7 is dedicated to what the authors describe as an exemplary customer service "infrastructure." The company cited is Network Equipment Technologies, Inc. (NET).

(continued on page 53)

Network World *welcomes letters from its readers.*

Letters should be typed, double-spaced and sent to Editor, Network World, *161 Worcester Road, Box 9172, Framingham, Mass. 01701.*

Letters may be edited for space and clarity.

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Next to AT&T's enhanced fractional T-1 service, the others seem like plain vanilla.

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These features include multipoint capability with analog and digital access. And a wider range of digital transmission speeds with the addition of Digital 9.6 kbps Service, so you can transmit data end-to-end at 9.6 kbps.

And ACCUNET Spectrum of Digital Services now gives you a Subrate Data Multiplexing option. So you can multiplex through an AT&T Central Office up to five 9.6 kbps access lines into one fractional T-1 channel, reducing line costs and simplifying network configuration.

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Trends and
TECHNOLOGIES
RESHAPING
networks:

Higher bandwidth needs

Satisfying bandwidth hunger

Fueled by an ever-growing array of communications and information services, network managers' appetite for bandwidth is at an all-time high. Can their cravings be satisfied?

By SID BANERJEE, JIM HARRISON and JEFF HELD

Today, the 1.544M bit/sec speeds of T-1 technology no longer meet the demands of an ever-growing array of network-intensive data applications.

Emerging image- and graphics-intensive platforms depend on high-speed networking technology.

Facsimile technology has evolved from a curiosity to an essential component of communications. New video and enhanced residential services are desired by users and providers, and other new applications continue to be developed.

Recently, users have begun to demand connectivity solutions for these bandwidth-intensive applications. Users must bear in mind, however, that high-bandwidth applications will require greater investment in the customer premises equipment that uses this broadband connectivity.

The limiting factor in many connectivity solutions is not the network, but the price of procuring and installing new end-user facilities. For instance, the terminal equipment required for corporate videoconferencing costs about $100,000 for each station.

As circuit costs decline and higher bandwidth services become available, users building broadband nets will be forced to consider overall system costs and installation trade-offs, not just bandwidth cost and availability.

Overcoming the obstacles

Over the last decade, improvements in networking speed, application functionality and connectivity have ignited an explosion in networking traffic, especially on the local-area network and at the LAN/wide-area network (WAN) boundary.

Copper-based LANs provide high-speed connectivity among network devices. But interconnecting LANs within the premises or over a wide area require a traffic-limiting bridge, router or gateway. Current applications operate within device limitations, but emerging applications will drive the need for higher speed facility bandwidth and LAN interconnectivity.

New data base applications will create more network traffic than current LAN and WAN media can handle. SQL, originally developed by IBM in the mid-1970s and now offered in network products from vendors such as Oracle Corp., GUPTA Technologies, Inc. and Ashton-Tate Corp., defines a common language by which applications can query, store and retrieve data across networking boundaries. Standardized data dictionaries define the location of data base components.

(continued on page 38)

Held is a partner and Banerjee and Harrison are senior consultants with Ernst & Young. All three provide communications consulting services for the Network Strategies practice of Ernst & Young in Fairfax, Va.

ILLUSTRATION ©1990 TOM BARRETT

ntinued from page 37)

istributed data bases, which traverse itional network boundaries, can be ted by integrating SQL applications data dictionaries. This data manage- t strategy is more efficient than the ent approach of downloading entire from device to device because smaller ions of the data base, rather than en- files, may be transmitted, altered and ed.

his technology will encourage the cre- n of more applications, which require vorked access across LANs and WANs. refore, the performance of these appli- ons is much more sensitive to network onse time — and hence, data rate.

n addition, user demand for high- dwidth applications that are currently ted in scope, such as imaging and hics, will substantially increase band- h requirements.

oday, banks, insurance companies health care institutions are leading the e for high-bandwidth imaging applica- s. Banks have begun to use mainframe- d, networked imaging applications for k capturing, processing and reconcili- n.

nsurance companies and banks are de- ping LAN work-in-process platforms pture loan or policy documents and to mate file processing. Files processed is way are easily accessible, annotat- tored and transmitted.

> oday, banks, insurance
> mpanies and health care
> stitutions are leading the
> rive for high-bandwidth
> imaging applications.

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arge credit card companies, such as rican Express Co., use both main- e-based imaging technology to cap- credit records and networked LAN ap- tions to recall and display captured rmation. Hospitals are also using im- g to capture, display and transmit pa- records, charts and billing informa-

ger fax pipes

volving fax standards will provide en- ced, higher bandwidth protocols. Pro- d standards for Group IV transmission been developed to allow transmis- over digital circuit- and packet- ched networks.

owever, until the advent of Integrated ices Digital Network technology, h allows the public switched network pport 64K bit/sec data traffic, devices support preliminary Group IV stan- s will require leased-line connections. her drawback to Group IV fax is that premises devices are larger and much e expensive — $10,000 vs. $1,000 — Group III fax machines.

nce current networking limitations overcome, Group IV fax is sure to be- e widely accepted, not only as a means ansmitting paper documents, but also standardized interface for image smission.

Group IV standards will likely be supported by computer-based imaging applications, blurring the distinction between fax and imaging. These developments all depend on the availability of high-bandwidth media for image transmission.

Fortunately, the ISDN B channel is an ideal vehicle for Group IV fax transmission because it will provide fairly ubiquitous availability of 64K bit/sec digital service, either through the Primary Rate Interface (PRI) or the Basic Rate Interface (BRI).

Video services

Video services, such as videoconferencing, video transmission of education and video training, have been available for several years, but widespread adoption has been slow because of high cost and impracticality. A broadcast-quality image requires at least T-3 (45M bit/sec) bandwidth for digital transmission. In institutions where there is no bandwidth to spare, video technology has depended on the procurement of additional, often costly, capacity.

State governments have utilized video technology by using public television stations during off-broadcast hours. For businesses or the government, microwave and satellite services have been procured.

Because of advances in video compression, digital speeds of 56K to 128K bit/sec are now satisfactory for limited bandwidth videoconferencing capabilities, though image quality is generally poor. In most cases, video technology must be explicitly planned, procured and managed outside the channels of traditional voice or data services to ensure acceptable performance and image quality.

As more bandwidth is made available to users at speeds of T-3 and higher, it will be possible to carry broadcast-quality images over the same network that carries voice and data. This will alleviate concern over bandwidth provisioning and operation, removing a major obstacle to the adoption of video technology.

Fiber is essential

Fiber technology is an essential transmission component to support wideband services. Traffic rates will be further increased as wave-division multiplexing (WDM) is developed.

WDM permits the use of different wave-

lengths of light to transmit different data channels over the same cable. By sending different light wavelengths through a fiber, different data channels can be transmitted through the same wire — a technique similar to frequency division multiplexing.

The technology that will have the greatest near-term impact on the implementation of optical fiber in the public-switched network is the Synchronous Optical Network (SONET).

The fundamental building block of the SONET standard is the Synchronous Transport Signal-Level 1 (STS-1). The STS-1 has a synchronous frame structure and a bit rate of 51.84M bit/sec. The synchronous frame alignment allows individual DS1s to be extracted from the STS-1 frame without the entire frame being disassembled — a process required with the current asynchronous DS1-DS3 hierarchy.

The bulk of the STS-1 frame is made up of the SONET payload envelope, a large information field that allows the STS-1 to carry a clear-channel DS3 signal (45M bit/sec) or a number of various lower rate signals.

> The fundamental building block of the SONET standard is the Synchronous Transport Signal-Level 1.
>
> ▲▲▲

Standards bodies working on the SONET standard have had difficulties reaching an agreement and have identified several issues that will not be resolved by the projected time, which was this month. These issues, involving network management and operations support, have been left for a later phase of the SONET deliberations.

Telephone companies have already begun testing and deploying SONET multiplexing and transmission equipment. They have found that the expense of the new equipment can be cost-justified because of the savings from equipment consolidation and network simplification.

The deployment of SONET equipment has also made it economically feasible for the regional Bell holding companies to begin installing fiber in the local loop. This factor will likely hasten the rate at which high bandwidth services are offered to business and residential customers.

Next-generation switching

Several proposed next-generation switching techniques, optimized for high-speed transmission over optical fiber, include asynchronous transfer mode switching, frame relay and the IEEE 802.6 standard, also known as distributed queue dual bus (DQDB).

Asynchronous transfer mode is a specific technique for wideband packet transfer, defined by the Consultative Committee on International Telephony and Telegraphy in the recent I-series recommendations. A crucial difference between asynchronous transfer mode and the current generation of data packet-switching techniques is that because asynchronous transfer mode is expected to be implemented on a highly reliable fiber network, much of the physical- and link-layer internodal error detection and correction is eliminated. This allows packets to pass through intermediate nodes with minimal delay.

The use of fixed packet lengths also decreases the overhead data and processing required in a packet, further reducing the delay.

While asynchronous transfer mode holds much promise for future broadband implementations, many functions have yet to be defined and several problems remain unresolved. Some of the many topics left for further study include: header format and size, payload type, error detection and correction, and terminal, virtual path and line equipment identification techniques.

There are also some doubts about the suitability and economy of asynchronous transfer mode as a universal transfer mode for all types of service, especially voice transmission. Asynchronous transfer mode has been identified as the switching technique of the future, but the technology is far from complete.

Frame relay is another form of packet transfer, but the technology is more mature and the products associated with it are commercially available. Frame relay was originally developed as an Open Systems Interconnection data link-layer protocol standard for transmitting packets of data between customer premises and ISDN central offices. Two different forms of frame relay — along with X.25 — are currently being considered for standardization as ISDN packet-mode bearer services.

The objective of frame relay is to move the virtual circuit identifier, currently implemented in the OSI network layer, down to the link layer. This will allow High-Level Data Link Control data frames to be passed between network nodes without the processing delay inherent in current X.25 implementations.

With these error-correction delays eliminated, frame relay will be able to pro-

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On the morning of September 23, 1989, Hurricane Hugo was still battering the city of Charleston, South Carolina. Yet the gale force winds and rain that pelted the city didn't stop us from helping First Union National Bank.

YOU'D BE SURPRISED AT WHAT WE SOMETIMES WEAR TO WORK.

When Hugo devastated the Carolinas, other banks had trouble getting money to their customers for food and supplies because land line data communications were in ruins.

Not First Union National Bank. A mere half-hour after Hugo passed, GTE Spacenet was at work realigning First Union's antennas. A short time later, their ATM system was operational.

That's what service is all about. At GTE Spacenet, we're constantly anticipating problems so they don't become problems. But on the chance that one occurs, we fix it fast-24 hours a day, 7 days a week. No matter where in the world they happen.

When we set up your business communications network, you can expect the best. But rest assured, we've planned for the worst.

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cess packetized information at much higher speeds.

The reduction in overhead and link-level error correction will allow for the use of packetized voice. It has been estimated that frame relay may be able to support transmission at up to 150M bit/sec, but it is truly optimized for transmission at less than 10M bit/sec.

Lack of control

One obstacle to the implementation of frame relay, however, is the lack of flow control and congestion control techniques. This will likely keep it from being used for management of very large networks, such as the public-switched network, until these issues are resolved.

One application of frame relay that is very attractive is providing data transmission in narrowband private or public networks. Frame relay should eventually become usable over either ISDN B, D or H channels. If frame relay is implemented in an ISDN, it will provide both voice and data packet transfer over the B channels and may very well replace X.25 as the D channel protocol.

One disadvantage of FDDI is that its variable packet delay precludes the support of voice or video transmission.

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Since the CCITT has been struggling with the frame relay and asynchronous transfer mode standards, many RBHCs have been concentrating on the IEEE 802.6 standard. The purpose of this standard is to allow the development of public metropolitan-area networks that could support large amounts of bandwidth on demand in a metropolitan area.

Although several alternate technologies were considered, including Fiber Distributed Data Interface (FDDI), the committee has tentatively settled on DQDB as the new metropolitan net standard. This standard now awaits the formal approval of the full IEEE membership.

While 802.6 is optimized for public, high-speed metropolitan-area networks, FDDI is emerging as the technology of choice for private, high-speed campus-area or intrabuilding backbone LANs.

FDDI is based on counterrotating, multimode fiber rings with a maximum internode distance of 2 km and a maximum aggregate distance of 100 km.

Although this distance limitation currently prohibits FDDI from wide-area implementations, standards bodies are researching how FDDI can be interfaced with SONET to extend the reach of FDDI rings.

One disadvantage of FDDI is that its variable packet delay precludes the support of voice or video transmission. In response to this drawback, ANSI has begun defining a second version of FDDI, known as FDDI-II, which will allow chunks of bandwidth —in multiples of 6M bit/sec — to be carved out of the 100M bit/sec ring and dynamically allocated to isochronous T-1 channels that can support voice and video.

Done in '91

According to Jim Hamstra, chairman of the ANSI X3T9.5 subgroup focusing on FDDI-II, this portion of the standard should be complete by late 1991.

At the same time, another effort exists within ANSI to define a broadband computer link specification, known as the High Performance Parallel Interface (HPPI). The HPPI standard will specify data rates at 800M bit/sec and 1.6G bit/sec to allow communications at speeds beyond those that FDDI supports.

Although few corporate networks may need these extremely high speeds, development is being spurred by high-tech research labs that have a requirement for interactive viewing and manipulation of high-resolution computer models and images (see "FDDI is not fast enough for high-speed graphics," this page).

Currently, FDDI is best poised to play the role of the premises-based, high-speed backbone LAN.

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While each of the aforementioned technologies holds a great deal of promise, the synergy between them must be exploited for broadband networking to achieve its fullest potential. Although the telecommunications industry still has many issues to resolve before ubiquitous broadband networking becomes a reality, it is now possible to draw up a scenario of how these technologies may one day work together.

Currently, FDDI is best poised to play the role of the premises-based, high-speed backbone LAN. This backbone LAN will likely interconnect lower speed Ethernet or token-ring departmental LANs spread across a building or campus.

For many users, these copper-based networks will remain adequate for several years until it becomes both technologically necessary and cost-justifiable to string fiber to the desktop. However, the backbone LAN will allow for direct attachment of those high-powered workstations that now demand the full horsepower of FDDI to support bandwidth-intensive applications such as imaging.

As connectivity requirements extend beyond the premises, the number of alternatives increases and the possible scenarios become more complex. As is the case today, users will be able to choose between switched and dedicated service, but the services available are likely to differ dramatically from those offered now.

The telephone companies' first use of SONET transport equipment will be to provide clear-channel T-1 and T-3 circuits. But as SONET becomes more ubiquitous, the next generation of T-carrier multiplexers will allow users to connect their premises networks with private

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FDDI is not fast enough for high-speed graphics

Computer network developers have long debated on how to meet the bandwidth requirement for data links to workstations and frame buffers to support high-speed graphics, as well as the computer networks that can support such links. Fiber Distributed Data Interface (FDDI) is often mentioned as a possible solution. The question is whether FDDI can, indeed, meet these requirements.

Network developers must first look at the requirements of end users. These needs vary significantly, depending on which visualization tools a user needs.

For example, at the Los Alamos National Laboratory (LANL) in New Mexico, some users require interactive movie-mode visualization of their supercomputer computations ranging from two to 30 frames per second. LANL has implemented a high-speed frame buffer with a resolution of 512 by 512 pixels with eight bits of color. The frame buffer connects to a Cray Research, Inc. supercomputer channel operating at an aggregate rate of about 25M bit/sec. With this frame buffer, it's possible to produce movies of 24 frame/sec without loading down the Cray channel.

However, some users still need more resolution and more color to support their graphics demands, requiring at least 1,024 by 1,024 pixels with 24 bits for color. To produce a 30 frame/sec movie on such a system requires a data link that supports 755M bit/sec.

Data compression techniques are not always possible because of the delays the techniques introduce.

At the same time, security constraints may prohibit the use of a shared-media local-area network approach, whether carrier-sense multiple access with collision detection or token-passing, such that only a point-to-point link is acceptable.

In addition to the visualization requirements, other areas of distributed computing require video, data and voice traffic to be present on the same data link. In this scenario, a similar bandwidth is required. Since FDDI cannot provide these rates or the security constraints, LANL has been leading the effort to develop an ANSI-standard 800M bit/sec computer link specification, called the High Performance Parallel Interface (HPPI). The HPPI specification actually specifies two data rates: 800M bit/sec for the 32-bit version and 1.6G bit/sec for the 64-bit version.

Data compression techniques are not always possible because of the delays.

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Simply having an HPPI frame buffer or an HPPI connection to a high-end workstation does not necessarily mean a user's system will receive an effective data rate of 800M bit/sec, just as having FDDI will not guarantee they will get a 100M bit/sec data stream. The actual effective data rates seen on Ethernet will probably track to the actual data rates seen on an FDDI network and will depend on the number of active nodes on the FDDI local network.

It follows that the type of network to which an HPPI node is connected will determine which data rates the user will actually experience. While FDDI specifies a type of network architecture (token-ring), HPPI does not. At LANL, the visualization requirements for HPPI make it necessary to provide an efficient path through the network and force network developers to try some new hardware techniques to keep the aggregate data rate close to the ideal.

To do this, LANL is implementing a network architecture based on crossbar switches to support HPPI links among supercomputers and to those users that require the full bandwidth. For those users with lesser bandwidth requirements, which FDDI could meet, an HPPI/FDDI gateway could be used to connect an FDDI local net to the HPPI environment.

Networking supercomputers and application-specific computers may soon require a link with bandwidth in the gigabit range. For users who require high-resolution movies, interactive control, minimal or no compression/decompression, and possibly the security of a point-to-point link, a solution based on FDDI simply will not work. These user requirements exist today, and the demand for this capability will increase.

Network developers at LANL say they believe the answer is a network based on HPPI.

— *Stephen Tenbrink*

Tenbrink is a section leader in the computer division at the Los Alamos National Laboratory in Los Alamos, N.M.

ATTENTION

California Network Managers

Network Management Solutions (NMS), the industry's premier network management conference, is coming to California April 10-12 at the Anaheim Hilton Hotel.

NMS, in its third year, has earned a reputation among attendees as the network management industry's yearly summit meeting bringing together the country's leading users and vendors to focus on one topic . . . network management.

NMS is a unique opportunity to experience 'hands on' live demonstrations of the network management offerings from the world's premier network management vendors. Companies like:

- AT&T
- DCA
- DEC
- IBM
- General DataComm
- Hewlett-Packard
- Make Systems
- MCI
- Northern Telecom
- Synoptics

and others have demonstrated their network management products at NMS.

The 1990 NMS program will offer these topic tracks that will run all three days:

- LAN Network Management
- WAN Network Management
- User Case Studies

The three-track program will give you the opportunity to concentrate on one topic area, or mix and match sessions.

But hurry because there are only 500 reservation opportunities for NMS.

If you feel knowing more about network management would help you do a better job and give your company an added competitive advantage in your market, I urge you to call 508-879-6700 or fax 508-872-8237 immediately to evaluate our program.

See you in Anaheim.

Gary J. Beach

Gary J. Beach
President/Publisher
Network World

NETWORK MANAGEMENT SOLUTIONS

NETWORK WORLD

See the FAXNeT Form on Page #57

Bandwidth hunger

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SONET OC-1 and OC-3 circuits.

Those users who choose switched services from the telephone companies will have a number of options as well. By the time broadband nets are put in place, ISDN implementations should finally be nearing completion. However, the bandwidth needed by users is likely to be much greater than that provided by a 64K bit/sec ISDN B channel.

PRI and BRI will still have a role in providing lower speed access to these broadband networks, but the higher speed H channels — defined as up to 135M bit/sec — will need to be more fully developed and interfaces will need to be built. In addition, frame relay will likely replace X.25 as the packet-handling protocol, providing users with higher data rates through ISDN.

Once again, SONET will likely be the enabling technology that allows physical-layer connectivity. However, upon attaining access to a central office, users will have a host of switching options available to them.

RBHCs are already testing high-bandwidth on-demand services through 802.6-compliant equipment. These offerings will provide enterprise and interenterprise networking in a metropolitan area. The logical next step is to deploy broadband switches using asynchronous transfer mode switching.

When these technologies are in place and interconnectivity is provided between all the islands of high-bandwidth services, then we will be able to say we have truly entered the world of broadband ISDN.

To migrate to a broadband environment, users will need to plan carefully the procurement and installation of devices that will use the network. Because fiber technology will use standards and protocols not currently supported, users will need to install new interfaces to retrofit existing equipment.

High-end LAN workstations — such as IBM Personal System/2s and Sun Microsystems, Inc., Digital Equipment Corp. and Hewlett-Packard Co. workstations — will make the transition easily to more graphics-intensive, distributed environment platforms, but increased demands on processor capacity will render many existing computing resources obsolete.

SONET will be the enabling technology that allows physical-layer connectivity.

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Fax technology is likewise evolving, and the price to pay for Group IV standards is a lack of backward compatibility with Group III devices.

Group IV machines will initially cost more than current devices and will not provide enhanced features when communicating with older devices. Users must evaluate the costs and benefits of such purchases during the transitional phase between Group III and Group IV, which is sure to occur during the 1990s.

Video technology implementation has been hampered in the past by the complexities and costs of interconnection. Even when bandwidth costs and network facilities evolve to support voice, data and video cost-effectively on common media, the largest costs for video networks — studios, cameras, coder/decoders and networking interfaces — will still be borne by users. Users must determine whether they will pay these costs even if bandwidth is available and cost-effective.

Wideband applications are becoming a reality today. Protocols and standards that harness the networking power of broadband technology continue to be refined. Equipment and transmission costs are declining rapidly as a result of new technology.

In time, increased product competition and availability will further accelerate this downward pricing trend. To exploit these emerging products and technologies, however, users need to look beyond simple voice/data integration and begin planning now for the implementation of broadband networks.

Can LECs cope with challenge?

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ness constraints and proposing communications solutions with those issues in mind. They have also made network management — particularly configuration management, billing and performance analysis — a high priority.

Two outcomes

Given this type of focused and well-funded competition, local exchange carriers face two possible outcomes in the battle for next-generation networks.

In the first scenario, they provide the value-added interface between user LANs — including campus Fiber Distributed Data Interface nets — and interexchange carrier broadband networks.

In the second scenario, local exchange carriers are repeatedly undercut by bypass fiber carriers, interexchange carriers and private corporate resources.

Forces seem to be pushing the majority of local exchange carriers toward the second scenario. They must act quickly and decisively to reverse this trend.

Whether local exchange carriers can enact the cultural and technological changes required for next-generation nets is still a matter of debate.

Watch the signs

Signs that they are on the right track will include availability of high-speed metropolitan services, compatibility with interexchange carrier offerings, competitive network management products and proactive, responsive sales forces.

If these signs don't begin appearing within the next 12 to 18 months, count local exchange carriers out. Focus on interexchange carriers and private corporate resources as the centerpiece of next-generation networks.

British regulator discusses policy

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was no serious objection to the continuation of price caps at all. We had a lot of comments from users and their representatives, and they all thought that it was a good system.

What options are you considering in the upcoming review of the U.K.'s telecommunications policy?

I should say first that the review actually begins in November, so the conclusion is likely to be in the middle of next year.

The options [we are considering] are all kinds of additional liberalization. At the moment, we have two competitors in basic fixed-link service, and we'll consider having more at the national level.

Cable television is also a very important issue. We already allow cable television companies to provide telephony through an agreement with British Telecom or Mercury. In the future, we might allow them to provide service without British Telecom or Mercury, and we might consider allowing British Telecom and Mercury to participate in the provision of television.

I consider this a very important area, indeed, because the cost of providing television and telecommunications is bound to be less if they are provided together rather than separately.

There also are a number of options we are considering of a more specialized nature. We could, for example, allow more freedom in satellite operation.

I always present competition as a trade-off between the loss of economy of scale [by creating more competitors], and the efficiency gains because of pressure to serve users better. We have to be careful in balancing those forces.

In what ways might satellite services be liberalized?

The current position is that vendors can provide point-to-point and point-to-multipoint one-way services. What we're looking at is allowing full two-way service.

You have said publicly that cellular telephone service could become a serious competitor to the terrestrial network. Do you believe that's realistic?

Yes. While it's very difficult to be precise at this stage, there is a general consensus based on careful economic forecasting that in the second half of the decade, cellular will be comparable in price to fixed service.

Eventually, this could lead to universal acceptance of telephones in the pocket. The concept of universal service could be to people and not to places, using lightweight handsets that would be very easy to carry.

Do you have any advice for U.S. regulators?

Well, I would say that the chief challenge facing your people is the integration of television and telecommunications. I think that's a very important engine for the future because it's going to be much cheaper to make broadband services available if you allow that.

U.K.'s Bryan Carsberg

We're not favoring broadband services over other things. Indeed, we want to let both mobile and broadband earn their own place in the market. I actually think the future is between those two. It will be very interesting to see how it all works out.

Firms benefit from technology

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to the appropriate service representative.

With the system, Lotus found its agents could concentrate on more specific areas of the company's diverse product line and, therefore, handle questions more quickly and effectively.

"One of the hot topics in business today is that you have to pay better attention to the customer because of the increase in competition," said Brandstein, editor of the study, which is titled "Strategic Applications of Telecommunications: Customer Service, Telemarketing, and Sales Automation."

L.L. Bean, Inc., the Freeport, Maine-based catalog retailer, has implemented an on-line order-entry system, designed in-house, and an ACD to handle its high volume of incoming calls.

L.L. Bean has made it easier for customers to order merchandise and check on product availability, while cutting back on the amount of time customer service representatives need to spend with each customer.

Regular customers can dial into the L.L. Bean system and, through a Northern Telecom, Inc. private branch exchange and ACD, place an order directly or check on product availability simply by using the telephone keypad to input product and credit card numbers.

Customer histories with addresses and a record of past purchases are stored centrally.

Spiegel, Inc., the nation's largest catalog direct marketer with an average of 38,500 order calls per day, has a similar system for its customers, the study said.

In addition to offering a 24-hour-a-day, toll-free ordering system similar to the one used at L.L. Bean, the Chicago-based retailer offers a voice-response system for customer returns, freeing up agents' time to take orders.

Spiegel also uses Dialed Number Identification Service (DNIS) through AT&T's Megacom 800 service to help speed sales transactions.

Spiegel offers a number of specialty catalogs, and DNIS lets sales representatives know in advance from which catalog the customer is ordering.

In addition to using technologies to offset costs and automate customer service, companies in the study used software packages built into ACDs that perform call accounting and traffic analysis to help net managers tailor telecommunications networks and schedule personnel.

Both L.L. Bean and Spiegel record details about the number of calls received and answered, and project the inbound calling traffic to assign their sales representatives more efficiently.

Plugging in to matrix switches

CONTINUED FROM PAGE 1

nects to a central switch unit with up to three miles of 62.5/125 micron multimode, fiber-optic cable. The distance limit for Data Switch's older satellite switch units is 300 feet.

Data Switch's new product is based on the idea that since fiber satellite units occupy only 17 vertical inches for 64 ports in a 19-in. rack, they can be located throughout a large data center or campus data center environment. For example, the fiber satellite unit could be located near an older switch, maybe even a competitor's switch, and bring data line interfaces into a central connectivity group using newer matrix switch technology.

The Liberator fiber satellite unit is central to Data Switch's present generation of matrix switch technology. Universe, a product line that replaces Galaxy and supports the fiber-optic satellite switch unit interface, consists of four components.

The central switching cabinet interfaces to the fiber satellite units. The distributed satellite cabinet is a copper cable-interfaced satellite switch unit supporting 320 ports. The fiber satellite cabinet houses up to five fiber satellite units in a single 4-sq.-ft. rack.

Data Switch intends to sell aggressively into its competitors' installed base by offering to rent and lease Liberator units. How willing users will be to add matrix switch ports from a competitive vendor remains to be seen.

Previously, matrix switches didn't provide multiplexing, a shortcoming that distinguished them from T-1 multiplexers. But that's no longer true.

Last month, Data Switch announced a family of high-speed interface cards that gives its matrix switch T-1 multiplexing capability, including a T-1 interface for domestic 1.544M bit/sec channels and international 2.048M bit/sec channels.

The products are expected to be available in the third quarter of 1990; interface cards for V.35 and X.21 interfaces up to T-1 rates are also expected to be available later this year. The T-1 multiplexer that Data Switch offers is an OEM product, available from a vendor that Data Switch declined to identify.

Bytex, the other leading vendor of matrix switches, has offered its DNS T-1 switch since September 1989. The Bytex DNS handles up to 34 T-1 trunks per node with two nodes per cabinet. This T-1 switch is currently a separate product from Bytex's matrix switch, although the company plans to merge the two products within a year.

Both Bytex and Data Switch are quick to point out that their T-1 multiplexing capabilities are considerably less sophisticated than those of mainstream T-1

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Levin is president of Netcomm, Inc., a New York-based computer/communications consulting and systems integration company.

Newly announced functions of digital matrix switches — such as T-1 multiplexing — can make them more useful and cost-efficient.

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multiplexing vendors such as Timeplex, Inc. and Network Equipment Technologies, Inc. Matrix switch vendors claim their products don't compete with those of T-1 multiplexer vendors.

However, it's reasonable to assume that network managers will not resist the temptation to combine their T-1 multiplexing requirements with their matrix switch requirements for long. Such a capability reduces the number of components in the data center.

Users who have had a chance to make cost comparisons between T-1 multiplexers and matrix switches may find that matrix switches are cost-competitive with T-1 multiplexers. For example, an entry-level Bytex Unity 10 supporting 80 ports costs less than $20,000. The cost of a simple channel bank supporting the equivalent port configuration would rarely be any less expensive and, in fact, would probably cost more.

With matrix switches, the cost of the switching capabilities may be dwarfed by the costs associated with connectivity. Even the larger Bytex Unity 30, costing between $250 and $300 per port, or Data Switch's fiber satellite unit, costing between $300 and $350 per port, can compare favorably with the per-port cost of a T-1 multiplexer, which varies from $150 to close to $2,000.

Ironically, the Telenex Autonex matrix switch, capable of supporting the largest number of T-1 interfaces, does not offer multiplexing. Telenex converts all interfaces to a 10M bit/sec balanced four-wire interface. This four-wire interface is connected to a multistage electronic cross-point matrix switch facilitating the connection between any two interfaces.

The Autonex matrix switch offers the capability to convert interfaces within the switch; other matrix switches do not. But converting the data terminal equipment and data circuit-terminating equipment interfaces into a proprietary four-wire interface limits the capability to do T-1 multiplexing within the matrix switch.

Only time will tell if the matrix switch will penetrate the traditional T-1 multiplexer market. But matrix switch vendors will probably increase the multiplexing capabilities of their products in the future. Because matrix switch vendors have had a difficult time differentiating their products, T-1 multiplexing is bound to be quickly exploited as a future product enhancement.

Net management

Every data communications vendor is promoting its network management capabilities; the leading matrix switch vendors are no exception.

Data Switch recently announced Release 2.0 of Totalnet, its network management software package. Originally announced in the fall of 1988 and released in March 1989, Totalnet includes a certified interface to AT&T's Accumaster Integrator.

Totalnet runs on a Sun Microsystems, Inc. workstation with 90M bytes of hard disk storage. Additional net management control consoles are dumb terminals attached to one of the workstation's 16 I/O ports.

Totalnet supports only one parallel printer interface. The Sun workstation may be attached to additional nonintelligent workstations through terminal servers connected via an Ethernet link running the Transmission Control Protocol/Internet Protocol.

Third-party products, such as an AT&T private branch exchange being monitored with the Accumaster Integrator, can be connected to Totalnet if Totalnet is set as the server, the third-party products are the client terminals and all messaging between them is sent as asynchronous ASCII data. Additional workstations cannot connect to the TCP/IP link and act as a peer to the Sun workstation running Totalnet.

Bytex integrates its Unity Management System (UMS) network management processor into its line of Unity matrix switches. UMS controls all Unity products and consolidates many control terminals using its multiwindow feature.

UMS is available in three flavors: basic switch control through Bytex's system control console; simultaneous UMS/NetView operation using an optional 3270 support package; and operation under NetView using Unity network link products.

The Unity network management facility, announced about four months ago, does not truly integrate Bytex's DNS matrix switch.

According to Kathy Rocha, Bytex's director of marketing for network management and control, Bytex intends to "consolidate control of the entire product line, including our matrix switch and T-1 products" in the near future. Rocha promises "enhanced management capabilities, including command-level files for automation and alarm management functions [also called triggers] later this year."

The Unity NetView Link combines old and new Bytex switches, as well as IBM's own 3728 matrix switch, into an IBM NetView network control center. NetView controls the Bytex matrix switch as part of overall management of network resources.

A second IBM software package, Matrix Switch Host Facility 2, resides in the mainframe processor. This software links the matrix switch control with NetView through Command List programs. The host may send commands to the matrix switch or receive menu screens and reports from the matrix switch. Expect vendors to enhance the ability of

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How the digital matrix switch began

A digital matrix switch combines communications technologies found in T-1 multiplexers, private branch exchanges, data PBXs, time-division multiplexers, switching statistical multiplexers and circuit switches. However, because of its limited functionality, the digital matrix switch offers little real competition to any of these other components.

With digital matrix switches, a high-speed multiplexer bus facilitates connection between ports. Unlike a data PBX, the digital matrix switch connections are not changed by user-initiated terminal commands. Instead, matrix switch connections are changed through terminal commands issued from a network control center.

A digital matrix switch provides interface ports for data terminal equipment and data circuit-terminating equipment; these are typically Electronic Industries Association RS-232 and CCITT V.35 interfaces with data rates from 300 to 2.048M bit/sec. Users store lists of connections between the data terminal and data-circuit terminating equipment ports, which represent a configuration of front-end processor ports connected to modems and channel service units for digital transmission lines.

When a front-end processor fails, the network control center operator can type a command on the digital matrix switch console and change the data terminal and data-circuit terminating equipment port connections from the modems and associated transmission lines to the spare front-end processor.

Switching at the digital interface is the commonly accepted method for sparing communications ports because that technique allows the modem to remain connected to the transmission line. Otherwise, duplicate modems would be required.

In the early years of matrix switching, many users mistakenly believed that a digital matrix switch would eliminate cable management problems within their data centers. After all, they reasoned, the product's ability to switch any port to any other port should have eliminated recabling forever.

However, the truth was that the first generation of digital matrix switches had limitations on the kinds of interface and associated data rates that could populate any given internal switch shelf. The result was the need for considerable recabling as front-end processors in the data center grew in number.

The classic digital matrix switch of the early 1980s was:

- Located within a large data center.
- Used to reconfigure and spare front-end processor ports.
- Used primarily for bulk port transfers among front-end units.
- Controlled by a network control center console, or dumb terminal.

Digital matrix switches were the replacement for electromechanical switches, some of which were built into digital electromechanical patch panels. One advantage of the digital matrix switch was that it was electronic; another was that it was controlled through a terminal and microprocessor within the matrix switch.

> The switch was also useful for net management.
>
> ▲▲▲

The average digital matrix switch user had one or more IBM mainframes in a data center environment with more than one front-end processor. Gradually, users realized that they could use digital matrix switches for applications other than front-end processor sparing.

Front-end processors represent communications interfaces similar to those found in minicomputers and smaller mainframes with integrated communications adapters, such as the IBM 9370. Corporate data center managers began to use digital matrix switches to spare all the communications ports of a minicomputer or specific groups of minicomputer ports.

Digital matrix switches also began appearing in "dark" data centers — remotely located, unmanned data centers containing a remote communications concentrator, a device that combines many lower speed data lines into one high-speed trunk data line. The digital matrix switch allows the switching of all data lines to a spare communications concentrator when necessary.

Network managers began to realize that the digital matrix switch was also a useful tool for network management and control because it provides the ability to alarm or trigger a notification when a specific event occurs.

For example, the digital matrix switch may be programmed to display an alarm if the signal on Pin 8 (carrier detect) of a specific communications port changes from its normal state. If carrier detect disappears on this communications interface, the network manager receives an error message on the switch console and then knows the communications channel has been lost.

The second generation of digital matrix switch technology began in the late 1980s when the emphasis moved to the product's net management capabilities.

Finding it increasingly difficult to differentiate their products, matrix switch vendors introduced microprocessor-based management systems, initially using only floppy disk drives. Some matrix switch control systems, such as T-Bar, Inc.'s Overlord system, came to market much later than promised and had a switch-oriented network viewpoint, which was very limited.

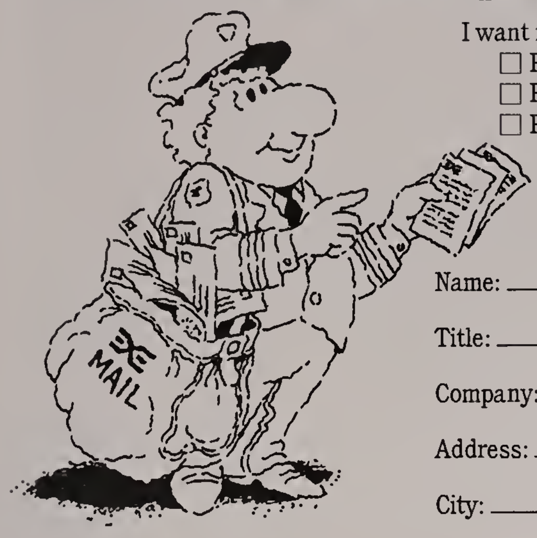
Data Switch led the marketplace with a performance measurement hardware/software facility as an adjunct to the matrix switch. Since the performance measurement facility is physically separate from the matrix switch, users may choose to buy a separate matrix switch.

Most users prefer to minimize the number of vendors from which they buy. Many users choose a single vendor for data communications matrix switching, channel switching, performance measurement facilities and channel extension facilities.

Data Switch has always led the pack in terms of a total solution for the data center's connectivity requirements. Other vendors, including Bytex Corp. with its recently introduced channel switch, have been forced to provide similar products or suffer the consequences of a limited product line.

— David Levin

"GET MUCH, MUCH MORE!"



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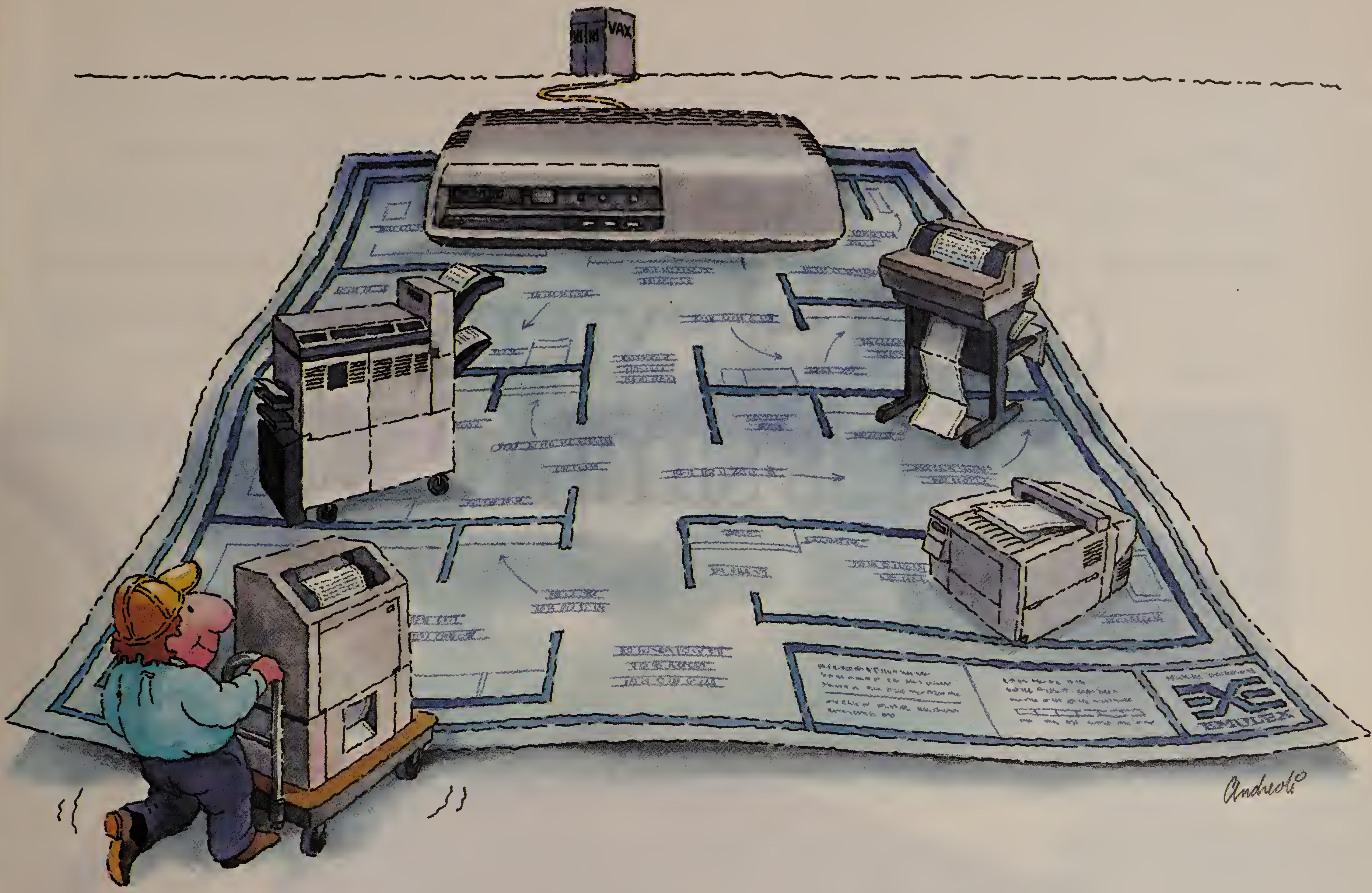

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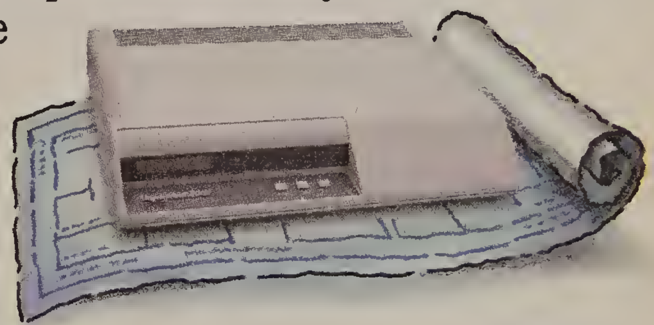

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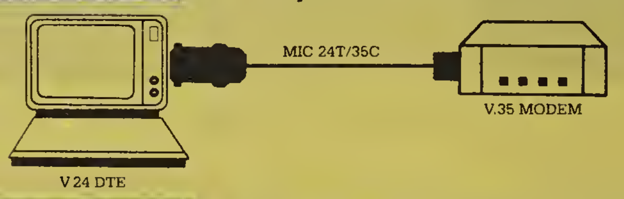

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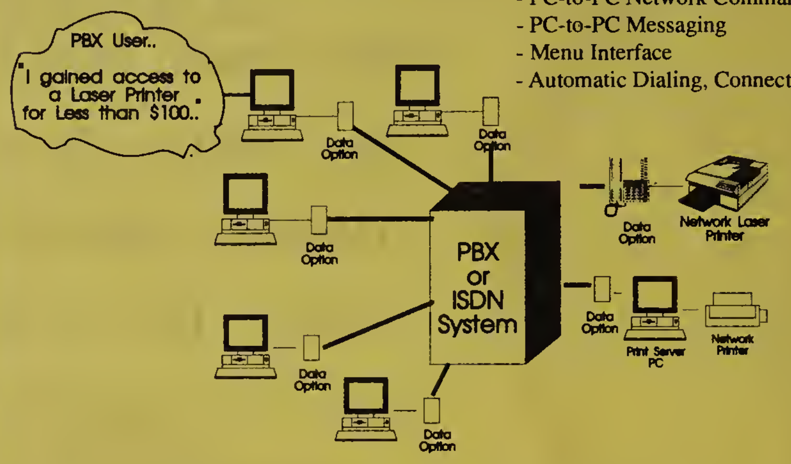

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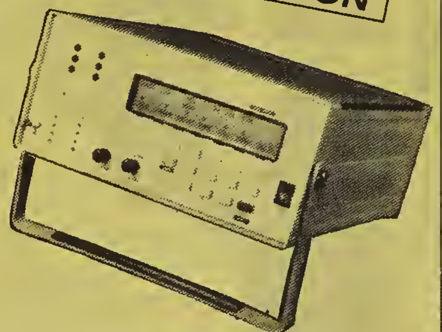

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NetLight-1

ETHERNET ™ / IEEE 802.3 Attachment Unit Interface Line Monitor

- Provides On-Line Network Status Indication
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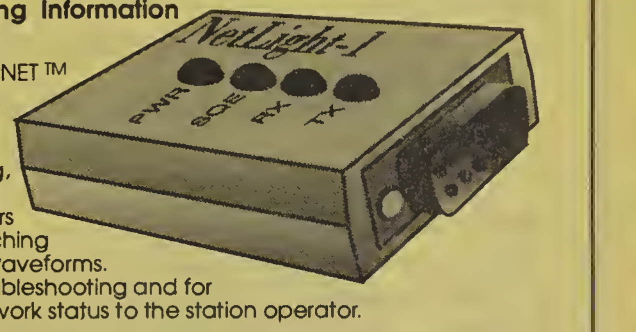

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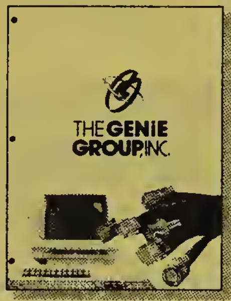

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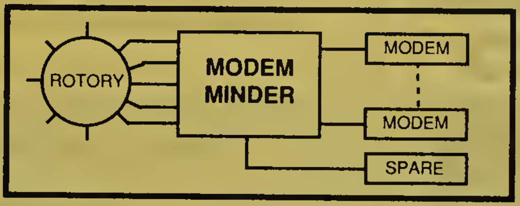

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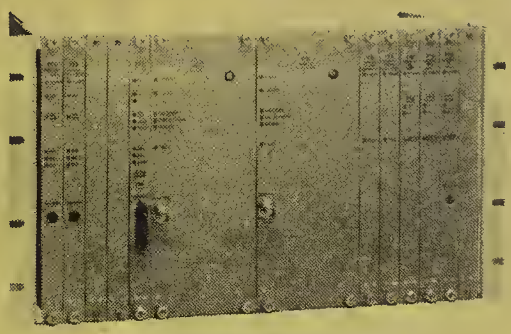

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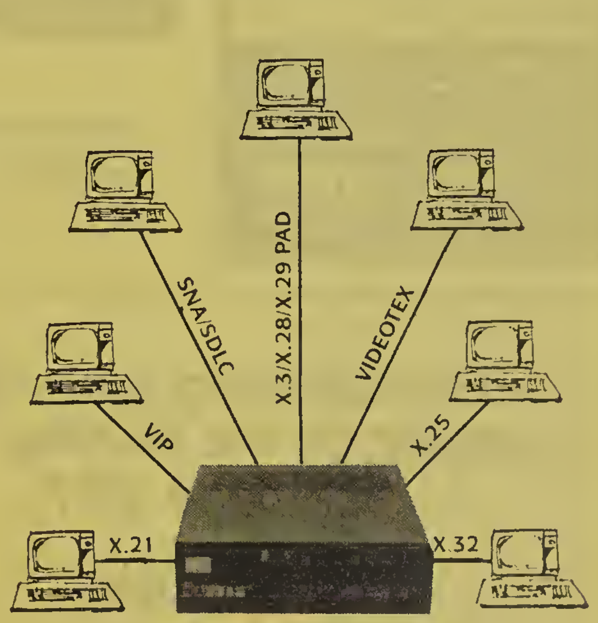

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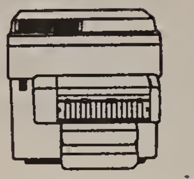

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C. Please Answer ALL Questions, Sign & Date the Form.

1 Industry: (check one only)

01. ☐ Manufacturers (other than computer/communications)
02. ☐ Finance/Banking
03. ☐ Insurance
04. ☐ Real Estate
05. ☐ Healthcare Services
06. ☐ Legal
07. ☐ Hospitality
08. ☐ Retail/Wholesale Trade
09. ☐ Transportation
10. ☐ Utilities
11. ☐ Education
12. ☐ Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry)
13. ☐ Government State/Local
14. ☐ Government Federal
15. ☐ Military
16. ☐ Aerospace
17. ☐ Consultants (independent)
18. ☐ Carriers
19. ☐ Interconnects
20. ☐ Manufacturers (Computer/Communications)
21. ☐ VAR/VAD/Systems House
22. ☐ Distributor, Computer Related
23. ☐ Distributor, Communications Related
24. ☐ Other ______

2 Job function: (check one only)

1. ☐ Networking Management (Responsible for both voice & data)
2. ☐ MIS Management (VP, Dir., Department Head)
3. ☐ Corporate Management (Chairman, President, Owner, General Manager, CEO, CIO, VP)
4. ☐ Data Communications Management (Responsible for data only)
5. ☐ Telecommunications Management (Responsible for voice only)
6. ☐ Financial Management
7. ☐ Engineering Management
8. ☐ Consultant (Independent)
9. ☐ Other ______

3 What is the scope of your involvement in purchase decisions for Network/Communications products + services? (check one only)

1. ☐ Enterprise Wide (Organization/Subsidiary/Division)
2. ☐ Multi Enterprise (Consultants)
3. ☐ Department Wide

4 What is the total number of sites for which you have purchase influence?

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1

5 Your primary responsibility: (check one only)

1. ☐ Both Data + Voice
2. ☐ Data Networking Only
3. ☐ Voice Networking Only
4. ☐ None

6 Which transmission media do you use in your network: (check all that apply)

Public:
01. ☐ Switched-Based (DDD, Wats, Megacom, etc.)
02. ☐ Leased Line (not including T-1)
03. ☐ T-1
04. ☐ Fractional T-1
05. ☐ T-3/SONET
06. ☐ Broadband
07. ☐ ISDN

Private:
08. ☐ Satellite
09. ☐ Microwave
10. ☐ Fiber Optic

7 Is your network: (check all that apply)

LOCAL AREA NETWORK
1. ☐ Local (within building)
2. ☐ Local (in a campus environment)

WIDE AREA NETWORKS
3. ☐ International
4. ☐ National
5. ☐ Regional (several states)
6. ☐ Metropolitan

8 What is your network architecture? (check all that apply)

1. ☐ SNA
2. ☐ DECNET
3. ☐ OSI
4. ☐ GOSIP
5. ☐ MAP/TOP
6. ☐ TCP/IP
7. ☐ DCA (UNISYS)
8. ☐ OTHER ______

9 What is your LAN Operating System? (check all that apply)

01. ☐ 3COM (3+, 3+open)
02. ☐ LOCAL TALK (APPLETALK)
03. ☐ BANYAN (VINES)
04. ☐ DCA (IRMALAN)
05. ☐ IBM (LAN Server)
06. ☐ IBM (PC LAN PROGRAM)
07. ☐ MICROSOFT (LAN MANAGER)
08. ☐ UNGERMAN BASS (NET/1)
09. ☐ NOVELL (NETWARE)
10. ☐ TOPS
11. ☐ PROTEON (PRONET)
12. ☐ OTHER ______

10 What is your LAN environment? (check all that apply)

1. ☐ 4M TOKEN RING
2. ☐ 16M TOKEN RING
3. ☐ ARCNET
4. ☐ ETHERNET
5. ☐ STARLAN
6. ☐ FDDI
7. ☐ LOCALTALK
8. ☐ OTHER ______

11 Which operating systems do you utilize? (check all that apply)

1. ☐ IBM DOS (VSE)
2. ☐ UNIX
3. ☐ OS/2
4. ☐ OS/2 Extended Edition
5. ☐ MVS
6. ☐ VM
7. ☐ VMS
8. ☐ XENIX
9. ☐ PICK
0. ☐ OTHER ______

12 Please indicate by vendor the number of mainframes/minicomputers installed in your network.

VENDOR	MAINFRAMES A	MINIS B
01. DEC		
02. IBM		
03. AMDAHL		
04. AT&T		
05. BULL HN IS		
06. NCR		
07. DATA GENERAL		
08. WANG		
09. HEWLETT PACKARD		
10. PRIME		
11. TANDEM		
12. UNISYS		
13. CONTROL DATA		
14. OTHER		

13 Please indicate by vendor the number of microcomputers/workstations:

A. Presently installed in your network.

B. The approximate quantity you plan to install in the next 12 months.

MICROCOMPUTER/ WORKSTATION/ VENDOR	PRESENTLY INSTALLED A	PLAN TO INSTALL NEXT 12 MONTHS B
01. PCs based on 80286 chip		
02. PCs based on 80386 chip		
03. PCs based on 80486 chip		
04. 8086/8088		
05. Macintosh		
06. RISC-based workstations		
07. UNIX-based workstations		

14 What is your planned PC standard? (check all that apply)

1. ☐ EISA
2. ☐ MCA
3. ☐ NUBUS (MACINTOSH)

15 For which areas outside of the U.S. do you have purchasing influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East

16 Check ALL that apply in columns A and B

A) I am presently involved in the purchase process for the following products/services:

B) I plan to purchase the following products/services in the next 12 months:

Presently Involved A	Plan to Purchase B	LOCAL AREA NETWORKS:
01. ☐	☐	Local Area Networks
02. ☐	☐	LAN Servers
03. ☐	☐	LAN Services
04. ☐	☐	Cables, Connectors, Baluns
05. ☐	☐	Bridges, Routers, Gateways
06. ☐	☐	UPS
07. ☐	☐	LAN Storage Devices
A	B	COMPUTERS/PERIPHERALS:
08. ☐	☐	Micros
09. ☐	☐	Minis
10. ☐	☐	Mainframes
11. ☐	☐	Front End Processors
12. ☐	☐	Terminals
13. ☐	☐	Laptops
14. ☐	☐	Printers
15. ☐	☐	Work Stations
16. ☐	☐	Cluster Controllers

(continued on next column)

Presently Involved A	Plan to Purchase B	SOFTWARE:
17. ☐	☐	Network Management
18. ☐	☐	Micro to Mainframe
19. ☐	☐	Network Security
20. ☐	☐	Call Accounting
21. ☐	☐	Distributed DBMS
22. ☐	☐	Communications Software
23. ☐	☐	Applications Software
24. ☐	☐	Network Operating Systems Software
25. ☐	☐	EDI Software
26. ☐	☐	E-Mail Software
A	B	DATA COMMUNICATIONS:
27. ☐	☐	Modems (over 9.6kbps)
28. ☐	☐	Modems (under 9.6kbps)
29. ☐	☐	T-1 Multiplexers
30. ☐	☐	T-3 Multiplexers
31. ☐	☐	Fractional T-1 Multiplexers
32. ☐	☐	Data Switches
33. ☐	☐	Matrix Switches
34. ☐	☐	Packet Switches
35. ☐	☐	Protocol Converters
36. ☐	☐	Network Management Systems
37. ☐	☐	Terminal Emulation Boards
38. ☐	☐	Facsimile Machines
39. ☐	☐	Diagnostic Test Equipment
40. ☐	☐	DSU/CSU
41. ☐	☐	Data Security
42. ☐	☐	Data Compression Equipment
43. ☐	☐	Network Adapter Boards
44. ☐	☐	Microwave
45. ☐	☐	Messaging Software
A	B	TELECOMMUNICATIONS:
46. ☐	☐	PBXs (over 1000 lines)
47. ☐	☐	PBXs (200 - 1000 lines)
48. ☐	☐	PBXs (under 200 lines)
49. ☐	☐	Key Systems
50. ☐	☐	Automatic Call Distributors
51. ☐	☐	Voice Messaging Systems
52. ☐	☐	Video Teleconferencing Systems
A	B	SERVICES:
53. ☐	☐	Switched Voice
54. ☐	☐	Dedicated Leased Line
55. ☐	☐	T-1
56. ☐	☐	T-3
57. ☐	☐	Digital Data
58. ☐	☐	Packet Switched
59. ☐	☐	Centrex
60. ☐	☐	Central Office Lan
61. ☐	☐	Satellite
62. ☐	☐	On-Line Information
63. ☐	☐	ISDN
64. ☐	☐	EMail
65. ☐	☐	VSAT

17 Estimated value of networking equipment and services:

A: Which you helped specify, recommend or approve in the last 12 months?

B: Which you plan to help specify, recommend or approve in the next 12 months?

A	B	
1 ☐	☐	$100 million and over
2 ☐	☐	$50 - $99.9 mill
3 ☐	☐	$25 - $49.9 mill
4 ☐	☐	$20 - $24.9 mill.
5 ☐	☐	$10 - $19.9 mill.
6 ☐	☐	$5 - $9.9 mill.
7 ☐	☐	$1 - $4.9 mill.
8 ☐	☐	$500,000 - $999,999
9 ☐	☐	Under $500,000

18 Estimated gross annual revenue of your entire company/institution: (check one only)

1. ☐ over $10 billion
2. ☐ $1 to $9.9 bill.
3. ☐ $500 to $1 bill.
4. ☐ $100 to $499.9 mill.
5. ☐ $50 to $99.9 mill.
6. ☐ $10 to $49.9 mill.
7. ☐ $5 to 9.9 mill.
8. ☐ under $5 mill.

19 Estimated number of employees for your entire corporation:

1. ☐ over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ under 500

20 Which of the following ISDN products do you plan to purchase in the next 12 months? (check all that apply)

1. ☐ Basic Rate Interface Terminal Adapters
2. ☐ Primary Rate Interface Equipment
3. ☐ Voice/Data terminals
4. ☐ Voice-only terminals
5. ☐ Data-only terminals

21 From which of the following vendors will you consider buying your PBX/Central Office Switch? (check all that apply)

A PBX	B COS	
A ☐	☐	AT&T
B ☐	☐	ALCATEL
C ☐	☐	ERICSSON
D ☐	☐	FUJITSU
E ☐		HARRIS
F ☐		HITACHI
G ☐		ROLM
H ☐		INTECOM
I ☐		MEMOREX TELEX
J ☐		MITEL
K ☐	☐	NEC
L ☐	☐	NORTHERN TELECOM
M ☐		SAMSUNG
N ☐	☐	SIEMENS
O ☐		STROMBERG-CARLSON
P ☐		TOSHIBA
Q ☐	☐	OTHER ______

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the matrix switch to receive and act upon NetView commands in the future.

The Bytex Unity NetView Link runs on an Intel Corp. 80386-based IBM Personal System/2 Model 55 or equivalent with color monitor, 2M bytes of random-access memory and 60M bytes of disk storage.

Operating under Xenix, up to 16 dumb terminals may be connected to the PS/2.

Bytex does not support connection of microcomputers as peers to the Unity workstation, but instead offers a terminal-emulation package that allows a Digital Equipment Corp. VT-100-compatible terminal to emulate an IBM 3270 for access to mainframe-based network management resources.

Remote diagnostics

Bytex intends to develop strategic working relationships with its users. For example, the company recently introduced the Remote Test Access Link (RTAL) to help diagnose remote tail circuits. RTAL was originally developed specifically for Nynex and later released as a generally available product.

However, some special requests, such as a remote monitoring facility developed for AT&T, have not become products. In mid-1990, Bytex intends to release new software that will incorporate 15 to 20 of its users' most important enhancement requests.

Bytex also plans to start selling diagnostic test equipment as part of its Unity remote center management scheme, which combines all of Unity's network management hardware and software products.

The company has modified protocol analyzers and T-1 testers from Tektronix, Inc.'s LP Com Division to allow management of these devices and viewing of test results from a window within the Unity NetView Link software. In the future, Bytex intends to integrate additional diagnostic test equipment from other vendors.

The missing link

None of the matrix switch vendors has announced an Ethernet interface, let alone a 4M bit/sec or 16M bit/sec token-ring interface. What about T-3 data rates, especially since Timeplex and others have announced multiplexers for this environment?

Bytex says only that it will announce products for the local-area network environment in the near future. According to Rich Pasqua, director of advanced planning at Data Switch in Wilton, Conn., "Local-area networks are on our agenda." He claims that Data Switch will be making LAN-related announcements by the end of 1990.

Data Switch contends that a T-3 interface is not currently an important issue; the company plans to make an interface available when its users demand one. Bytex offers a T-3 interface on a special request basis but has no plans to make this a generally available product. However, in spite of their claims to the contrary, expect the leading matrix switch vendors to generally offer T-3 interfaces within a year.

Backup redundancy

Data Switch also last month introduced the Enhanced Redundancy System (ERS), which provides redundant central switching cabinets, each of which is spared with a second unit. (Sparing simply means having an extra switching cabinet configured as a backup unit.) All of the signal interfaces are transferred using a bulk electromechanical switch.

However, matrix switches already have redundant central logic boards and redundant power supplies. Why the need for more redundancy? According to Data Switch's Pasqua, "ERS is an insurance policy that some of our larger customers are asking for — a contingency plan for environmental catastrophic failures, not normal operation."

ERS is a mechanical switch in which 32 matrix switch ports constitute one port group and one patch connection to the switch. According to Gary Velotta, director of product management at Data Switch, some of Data Switch's users like the fact that the ERS is mechanical. But company plans do call for an automated version of ERS in the future.

In essence, one central switching unit may be spared across several on-line central switching units, much as a front-end processor is spared. Have we truly reached the point where we are sparing the switches that allow the sparing of the front-end processors that handle our data communications?

Other switch vendors

Telenex is aggressively selling its Autonex matrix switch, having recently displaced Dynatech for third place in market share of units installed, according to the Netcomm survey.

None of the matrix switch vendors has announced an Ethernet interface.

▲▲▲

Telenex offers a new integrated diagnostic facility for control of network diagnostics from the matrix switch console. The integrated diagnostic facility permits the transfer of both diagnostic control and data signals to the matrix switch console.

Telenex also announced the MegaSpeed matrix switch, which supports T-1 circuits and automatic data rate adaption, matching an incoming line's data rate from 56K to 2.048M bit/sec. Autonex offers the capability to connect dissimilar interfaces since all interfaces are internally converted to a proprietary 10M bit/sec protocol. Racal-Milgo resells the Telenex Autonex matrix switch as its own Series 5000 matrix switch.

Codex offers the Model 4803 matrix switch, although most of its research and development seems to be aimed at its 9800 integrated network management system. Codex is developing interactive NetView links, and its plans to incorporate the 4803 matrix switch into the 9800 management system remain unclear. The Codex 4803 offers neither T-1 multiplexing nor switching.

Datacomm Management Sciences offers two matrix switch models, both with a tandem matrix switch architecture. This architecture uses two complete matrix switches, each with its own redundant power supply. One switch operates on-line with the second acting as a hot standby. The Model MTRX-500 supports up to 512 ports, the Model MTRX-4000 up to 4,096 ports and the MTRX-8000 up to 8,192 ports.

Datacomm Management Sciences' product uses a popular LAN (Novell, Inc.'s NetWare with token-ring network interface cards) with popular data base management system software (Ashton-Tate Corp.'s dBase III plus) for its matrix switch control environment. Datacomm Management Sciences is actively exploiting microcomputer technology in its matrix switch product control.

Looking to the future

What can users look forward to in the development of matrix switch products? Higher speed interfaces and increasing distance between satellite units are two sure bets.

Additional interfaces, which should become available within the next six months, include T-3 and Integrated Services Digital Network interfaces. Now that matrix switches perform circuit switching for T-1 channels, can packet switching be far behind?

Also, look for increasingly sophisticated network management capabilities, including those that capitalize on interactive NetView links. Watch for vendors to integrate their matrix switch products with network management environments other than NetView, including AT&T's Unified Network Management Architecture.

Matrix switch vendors will eventually awaken to the reality of microcomputers and embrace interfaces to 10M bit/sec Ethernet and 16M bit/sec token-ring LANs. In the future, these vendors will build their switch management facilities on a server-based microcomputer LAN platform running Novell's NetWare or Microsoft Corp.'s LAN Manager.

Analysts warn of fax risk

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data port on a multiplexer.

Richard Conrad, assistant vice-president of State Street Bank & Trust Co. in North Quincy, Mass., said he is using the Ricoh 2100 for point-to-point fax transmissions to State Street sites in Boston and Sydney, Australia.

According to Conrad, the machine can operate at speeds ranging from 2,400 to 19.2K bit/sec. It is useful for supporting high volumes of fax traffic to Sydney via a 56K bit/sec link that also supports asynchronous traffic and IBM's Synchronous Data Link Control protocol.

Ricoh said the device also works in switched applications as opposed to just point-to-point.

ISDN to the rescue?

Down the road, ISDN may prove to be a cost-effective vehicle for supporting fax traffic, said William Kanupke, president of Kanupke Associates, a consultancy in Haddonfield, N.J. With ISDN Basic Rate Interface lines, which provide two 64K bit/sec B or bearer channels, users could transmit Group IV fax at 64K bit/sec over one B channel and discuss the fax over a voice circuit with the recipient via the other B channel, Kanupke said.

ISDN also gives users "the ability to transmit at much higher speed, which gives you greater clarity and also allows you to reduce your transmission cost because you can use the switched network for multiple services and don't need a dedicated line just for fax," he said. In addition, because ISDN is a switched service, users pay only for the bandwidth they use.

Such applications don't necessarily require users to have ISDN lines on both ends of the connection because central office switches can recognize that a destination is not on an ISDN and convert the call to a regular switched call, Kanupke said.

Expert discusses technology

continued from page 6

Is the lack of standardization on application development tool kits such as Motif and Open/Look a barrier to acceptance of X/Windows?

I think maybe it has accelerated acceptance by hardware vendors because it still gives them the ability to do what they want. I think it is slowing down acceptance by independent software vendors because they still see a fragmented market. The push from end users that I hear is, 'I don't care which [tool kit] you choose, just choose one and be done with it.'

What role, if any, does the consortium play in the standardization of tool kits?

We're trying to develop base software that everyone will use. The way vendors compete is by making their implementation better or faster than everybody else's and by whatever stuff they layer on top of it.

Are there any efforts within national or international bodies to standardize the X/Window System?

ANSI's X3H3.6 Committee has been working for two years on the standardization of the X network protocol [the underpinnings of the application development tool kits], which is the key attribute for portability across systems.

The IEEE has a committee, P1201, that is currently working on the possible standardization of an X tool kit.

So we have one part of ANSI at the bottom, one part of ANSI at the top, and they both think they're going to work toward a middle. It's almost impossible to do a tool kit standard without having standardized the middle layers.

On the hardware side, if an X/Window System terminal is a replacement for an ASCII terminal, how can vendors differentiate their products?

Cost and performance. One of the hard aspects is, how do you make your product cheap enough so it can appeal to users of the 50 million installed ASCII terminals? If you can get volume up high enough, you can get costs down, but people won't buy in volume until costs come down; there's a tension between the two. And unless vendors sustain performance comparable to what users get on a workstation, people will just buy the workstation.

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Conference-goers debate HL7

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the vendors that currently manage most hospital nets.

They also maintained that HL7 is a nascent standard that will take years to solidify if it is not replaced entirely by another industry standard, such as one currently under development by the IEEE.

According to Landen Bain, administrator of information systems (IS) at Ohio State University Hospitals in Columbus, using HL7 protocols makes good sense for large hospitals that have complex IS environments and users who want to pick their own systems.

HL7 eliminates the need and expense for hospitals to support a range of proprietary methods to connect different vendors' systems, Bain said. The hospital, a 1,000-bed facility, now stipulates HL7-compliance in its requests for proposal. Eventually, HL7 will be the only application interface the university will support.

So far, vendors have been cooperative, Bain said, even though critics have claimed that vendors will not fully support HL7 because open systems undermine marketing advantages they have with proprietary products.

"The [health care] industry is beginning to shift to a new information system paradigm," Bain said. "It used to be that you purchased an integrated system from one of four major vendors. With HL7, it will be easier to choose systems from any vendor."

But other conference attendees pointed out that HL7-based systems are not for everyone.

Michael Brown, president and chief executive officer of Gerber Alley & Associates, Inc., a hospital IS vendor in Norcross, Ga., was one of the five panelists in the HL7 session. Although his firm supports the HL7 movement, he contends that open systems shift the responsibility for supporting hospital IS from vendors to users.

> "The cost to redo our interfaces is a big deterrent to using HL7," Miller said.
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"Open systems require users to build and maintain networks, a responsibility they may not be willing or ready to assume," Brown said. A majority of hospitals today support mainframe-based, integrated systems that are upgraded and maintained by a single vendor.

Many users interviewed by *Network World* work at hospitals that fit Brown's profile. In general, these users are satisfied with a single-vendor system.

"We don't need HL7," said Lawrence Dux, director of planning and support services for Waukesha Health System, Inc., a 300-bed health care facility in Waukesha, Wis. "What we have works fine."

Waukesha Health System uses an integrated hospital IS from TDS Healthcare Systems Corp. in Atlanta, which handles all but two of the applications in the hospital. The hospital purchased its laboratory and surgery scheduling systems from two other vendors and linked them via proprietary interfaces to the mainframe running the TDS applications.

Other users said it would cost too much to convert existing systems to HL7 and then have to upgrade them every time the standard changed.

"The cost to redo our interfaces is a big deterrent to using HL7," said Kevin Miller, director of management engineering at Spohn Hospital in Corpus Christi, Texas.

In addition to the cost, Miller said the HL7 standard is not fully defined. He said he will wait to implement HL7 when the standard is more stable and he needs to support more applications from different vendors. That might not be for another five or 10 years, he said.

HL7 demo watchers impressed, skeptical

Users who viewed the Health Level 7 (HL7) demonstration at last week's annual information systems and management conference and exhibition were both impressed and skeptical.

The demo, which simulated a live hospital environment, used HL7 to link medical systems from seven vendors.

Conference-goers were invited to observe a typical patient hospital stay from an information systems perspective. Tour guides admitted a fictional patient to the hospital on one vendor's system, ordered lab and radiology tests on other systems, and compiled billing information on yet another system, all using shared data transmitted in real time across a network.

The systems were linked via an Ungermann-Bass, Inc. Ethernet backbone. A personal computer attached to the backbone and running Simborg Systems Corp.'s StatLan software handled network routing and ensured data integrity.

"The demonstration was impressive," said Lee Tracey, director of nursing at Hoag Hospital in Newport Beach, Calif. "Anytime seven vendors can update one another's applications using a standard interface, that's impressive."

But Tracey said he would like to see the same capabilities in a production environment before he becomes a true believer. "A demonstration like this never approaches the complexity of operations in the real world."

The demonstration was the third ever held. The first two demonstrations took place at health care conferences last year.

Susan Campbell, director of the demonstration, which was coordinated by Andersen Consulting, said users who attended this demonstration were more aware of HL7.

"They were not asking what [HL7] is, but how they can implement it," she said.

Vendors participating in the demonstration included Clinical Information Adantages, Inc., Community Health Computing, Compucare, Digital Equipment Corp., Enterprise Systems, Inc., Professional Healthcare Systems, Simborg Systems and SpaceLabs, Inc.

— *Wayne Eckerson*

Novell gives in on Named Pipes

continued from page 1

interprocess communications facility.

Currently, Novell only provides Named Pipes support for the OS/2 Requester, so only OS/2 workstation users can access SQL Server.

That has left DOS workstation users — who constitute over 95% of the users on NetWare LANs — a disenfranchised majority.

Most of the work done

Miller said that while there is no specific ship date for Named Pipes for DOS, most of the design and engineering work is already completed and Novell doesn't anticipate problems.

"The core technology is the same as what we've already engineered for our OS/2 Requester. The work's not trivial, but it's not monumental either. There's no doubt that we'll have product before the end of the year," Miller said.

Users said that until now, they have been unable to get a definitive answer from Novell as to when or if it would ship Named Pipes for DOS. The users also said they have received a similar runaround from Sybase, Inc., the codeveloper of SQL Server with Microsoft, which refuses to disclose whether it will write a NetWare Loadable Module (NLM) version of SQL Server.

The NLM version of SQL Server would reside directly on a NetWare server and would obviate the need for Named Pipes for DOS. Sybase officials could not be reached for comment at press time.

"Named Pipes for DOS is crucial to our business," said Dana Dunlap, network manager in Conoco, Inc.'s computer services department in Houston. "We have over 2,000 IBM PCs on 45 NetWare LANs, and it's totally unrealistic to ask our users to switch to OS/2 workstations or LAN Manager simply to get SQL Server."

Conoco recently installed NetWare Version 2.15 with a beta copy OS/2 Requester Version 1.2 to allow OS/2 workstations on the LAN to access SQL Server. "It works OK, but we'd much rather have Named Pipes for DOS, and we can't wait to get it," Dunlap said.

A dream come true

John Keefer, a LAN analyst for the Environmental Protection Agency's (EPA) LAN systems support group in Research Triangle Park, N.C., which boasts 3,000 PCs on about 85 NetWare LANs, was pleased that Novell has decided to forge ahead with Named Pipes for DOS.

"It's a dream come true. The ultimate solution of course, would be for Sybase to write SQL Server as an NLM, but Named Pipes for DOS is a good start," Keefer said.

The EPA currently runs a Superfund data base application on LANs in 10 regional field offices to track hazardous waste cleanup efforts.

"SQL Server is ideal for our needs, and we love NetWare. But right now, there's absolutely no good way to support DOS workstations with SQL Server, so this is great news," Keefer said.

"The last thing we want to do is convert to LAN Manager just to support SQL Server applications," he explained.

"It's coming just in the nick of time for us," observed Lorie Mouklas, a senior systems analyst at Hoechst Celanese's Engineering Plastics division in Chatham, N.J. Mouklas said his company has two NetWare LANs with a total of 50 personal computers and will install an additional 300 personal computers on several NetWare LANs in nine remote offices.

"If Novell had decided against providing Named Pipes for DOS, we would have been forced to install LAN Manager to run SQL Server," Mouklas said. "I've been praying that Novell would relent and introduce Named Pipes for DOS. Now if only Sybase will wake up and write an NLM version of SQL Server."

Users worried over FBI probe

continued from page 2

Sprint about the case last October, US Sprint said.

Among the claims is that US Sprint employees had allegedly tapped into government or competitors' computers to gain confidential information about rival bids on the FTS 2000 contract.

AT&T won the other 60% of the FTS 2000 contract awarded in December 1988, while the Martin Marietta Corp. and MCI Communications Corp. team was shut out. FTS 2000, which observers estimate will be worth about $25 billion over 10 years, is an upgrade of the 25-year-old FTS net that now serves federal agencies.

One user, who asked not to be named, said he is concerned the investigation may lead to a stoppage in the transition to US Sprint services. "That would be major headache. But I don't think there is any chance the project would be stopped for long or that we would be left hanging since the phone system is so critical to the government," he said.

Joseph McGovern, program analyst and FTS 2000 coordinator at the Department of Labor, which is part way through its transition to the new services from US Sprint, is also interested in what the probe turns up.

"I'll be concerned about a delay if there is some substance to the investigation," he said. "Right now, though, I've heard nothing that indicates there will be a halt in our progress."

Other US Sprint users under the FTS 2000 contract include the Federal Reserve System and the GSA, which is overseeing the project. Ironically, the FBI is also a US Sprint user.

The lawsuit against US Sprint came to light in a report published by the "Defense Contract Litigation Reporter," an industry newsletter. The report said the lawsuit was filed last year and put under seal pending a federal investigation into whether it had any merit.

US Sprint said it looked into the situation beginning last August amidst allegations from an exiting employee but found nothing to substantiate any claims of wrongdoing.

"We're confident, based upon our probes, that the FBI will find the allegations to be groundless," US Sprint said.

Network World called the FBI to confirm the investigation, but calls were not returned.

A spokesman for the GSA said his agency is an onlooker at this point since the investigation is being conducted by the FBI. It is too early to say what action the GSA might take, he said.

"All I can say is that FTS 2000 implementation is approaching the halfway point and is going forward," the spokesman said.

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User builds LAN-based image tool

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The company designed Automated Work Distributor with one of its two parent companies, DST Services, Inc. of Kansas City, Mo. DST is an IBM industry remarketer, which means it can sell the application with IBM hardware to other financial service companies. DST is also negotiating to have IBM sell the system, according to Jim Horan, DST's chief information officer.

BFDS is currently testing the application on an AS/400 linked via a 4M bit/sec IBM Token-Ring Network to 20 Personal System/2 workstations outfitted with image monitors, said Barry Strasnick, senior vice-president at BFDS. The PS/2s can access images stored on local-area network-attached direct-access storage devices (DASD) and optical jukeboxes, as well as work with IBM 3270-type applications running on DST mainframes in Kansas City.

The Automated Work Distributor software is transforming time-consuming paper-intensive operations into on-line processes, Strasnick said.

With the exception of those using the prototype ImagePlus application, BFDS workers must fill out forms detailing transactions, batch them and then shuffle the paperwork off to data-entry clerks, who enter the transactions into mainframe-based applications. Often, one shareholder letter can generate multiple transactions.

With the Automated Work Distributor, incoming mail is scanned into the system, indexed by characteristics such as transaction type and automatically distributed to employees who are qualified to handle specific transactions. Employees view images of customer letters while working on mainframe-based applications, many of which have workstation front ends that speed up and help verify data entry.

As work is performed on each transaction, the system allows users to enter a short description of what they did. This information allows customer service representatives to respond easily when shareholders call to check on the status of their requests.

BFDS uses PS/2s outfitted with IBM's Image Adapter/A card, which compresses and decompresses images and drives the image display on a separate monitor attached to the PS/2. In the prototype network, the PS/2s are attached via a Token-Ring Network to the AS/400, which is outfitted with 10G bytes of DASD. The AS/400 also supports a File-Net Corp. optical jukebox, which stores 64 2G-byte optical platters.

When the imaging network is fully deployed at the end of the year, Strasnick expects to be using two AS/400s, 400 PS/2s and at least three jukeboxes.

A Token-Ring bridge linked to a 3174 cluster controller in Kansas City via a 56K bit/sec line gives the workstations access to DST mainframes there. The bridge will be upgraded to an IBM 3745 Communication Controller with a 256K bit/sec link to another 3745 in Kansas City, Strasnick said.

The DOS-based PS/2s are outfitted with SoftLogic Solutions, Inc.'s Software Carousel, which is software that lets users easily toggle between DOS sessions much like OS/2 supports multitasking.

One of the DOS sessions is IBM 5250-type terminal emulation, which employees use to access image data managed by the AS/400 and some shareholder account information stored on the AS/400. Another session is a 3270 emulation application that gives users access to DST mainframes, where account history files are stored.

BFDS is in the process of migrating its PS/2s, which are now defined as Systems Network Architecture PU Type 2s, to PU Type 2.1s, Strasnick said. PU Type 2.1 devices can support IBM's Advanced Program-to-Program Communications/LU 6.2. "That will give the workstation immediate access to the underlying data it needs, whether that data is on the workstation, the AS/400 or the mainframe," he said.

In addition, the company expects to forge remote links to its clients, which are all mutual fund companies. "We'll most likely have Token-Ring bridges going to certain remote clients at either 56K bit/sec or T-1 speed," Strasnick said. "At that point, they can do at their facility anything we can do here."

Such a capability would come in handy for applications such as setting up new accounts. Today, that is handled by sending paper forms to BFDS via Group III facsimile or courier. With ImagePlus, BFDS customers could instead scan the paper applications at their sites, then ship the compressed image to BFDS.

For smaller clients, BFDS is working to integrate fax capability with ImagePlus.

"We are working on enabling receipt and transmission from the system to both Group III and IV faxes," Strasnick said. Group IV fax is especially suited for the imaging application, he said, because it is faster and most machines let users store large quantities of data and then ship them all at once over facilities such as AT&T's Switched 56 offering.

DST has installed the Automated Work Distributor application at one other site and is holding discussions about implementing it at six other sites, Horan said.

Sun NFS demo shows support

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tional DOS directory, and can use regular DOS commands to access, copy or store them, or print them out. No knowledge of the NFS host's operating system is necessary; the host simply runs a "daemon" process that gives DOS users access to NFS-mounted files and can provide them with print-spooling services as well.

Novell was demonstrating an unannounced NetWare Loadable Module (NLM) that implements NFS in a NetWare 386 server. This NLM will let NFS files be mounted in the server so Unix workstations can access those files.

NFS by itself doesn't enable dissimilar clients, such as Unix workstations and DOS computers, to share the same files on an NFS host. DOS users generally will be sharing one group of files while Unix users share another.

Some applications, however, enable cross-system file sharing. One example is WordPerfect Corp.'s WordPerfect. It has been ported to a variety of operating systems, including DOS and Unix. In an NFS net, different versions of WordPerfect on different types of computers could share the same data files on an NFS host.

A less transparent form of file sharing can be achieved when applications running on different systems on the network can read common file formats. Also, files created by one program and stored as ASCII text can be read or even cut and pasted across systems into another program.

In general, though, cross-system file sharing via NFS awaits a new generation of distributed applications. It is the applications that do the file sharing; NFS merely defines where the shared resources are and makes them available to various clients.

"Our first task was to get the system vendors to implement NFS, and we've been very successful at that," Keating said. "The next step — and it's a much harder one — is to get the application developers to use NFS to create distributed applications."

While Connectathon '90 began as an NFS interoperability testing forum, its charter was expanded last year to include X/Window System testing. The X/Window System uses the client/server model to enable a single host (the client in this case) to run an application that is displayed in windows on different types of workstations or terminals (the display servers).

The X/Window vendors at Connectathon '90 tested 56 client and server implementations against one another. Also, several developers of X/Window applications piggybacked on top of this, using the heterogeneous X/Window net as a platform for testing their products.

FCC weighs plan to ease rules

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tion in the interexchange market," Catucci said. "We think this is an option that the commission should find very attractive."

FCC officials declined to discuss details of the proposed rule making. However, several sources at the agency said AT&T's idea is being given strong consideration and was discussed previously as a possible solution to the legal entanglement surrounding Tariffs 12 and 15.

Dismay over proposal

Opponents of lessened regulation for AT&T expressed dismay that AT&T's custom network deals may be deregulated but predicted that such a move would not stand up in court if appealed.

One pitfall they pointed out in the AT&T proposal is that custom networks are packages of existing tariffed services. Critics question how the same service could be considered a regulated service in one instance and nonregulated in another.

A telecommunications attorney, who requested anonymity, said that allowing AT&T to choose whether a service will be regulated or not regulated on a customer-by-customer basis could lead to cross-subsidization — where money from regulated services could be used to fund custom network ventures.

David Nall, counsel for the Independent Data Communications Manufacturers Association, a vocal opponent of Tariff 12, said that because both unregulated network arrangements and regulated services would utilize the same network, it would be difficult to ensure that AT&T was fully recovering the cost of providing each service.

"It would be very difficult for the commission to create a system whereby facilities used for common carrier services by most of the public would be treated as non-common carrier for a select group of business users," Nall said.

Regulation unnecessary

Catucci said the high-end business market is highly competitive, making regulatory protection for customers unnecessary. "Large customers make contracts with their suppliers everyday, and they don't have tariffs. They've got enough clout with their supplier to negotiate the best deal," he said.

John Zeglis, a senior vice-president at AT&T who handles regulatory matters, echoed Catucci's view recently in a forum on telecommunications regulation sponsored by the Annenberg Washington Program.

He said current regulation serves only to keep AT&T from being able to lower prices and introduce new services demanded by customers.

Catucci said that if the FCC moves custom network deals outside the tariff arena, everyone — the FCC, AT&T and users — will win.

The FCC would be able to dispense with nagging questions about single-customer arrangements, and AT&T would be free to offer customers what they want, he said.

"I think it's an avenue that the commission could take and solve one of their real knotty problems. Right now, they don't have a solution to the Tariff 15 problem," Catucci said.

Large users would win because they could negotiate exactly the type of deal they want, he said. In addition to contracting with customers on an individual basis, AT&T would also continue to offer custom networks through tariffs.

Give them what they want

"If [customers] want a tariff, we give them a tariff. If they want a contract, we give them a contract," Catucci said.

> "If [customers] want a tariff, we give them a tariff. If they want a contract, we give them a contract," Catucci said.
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Catucci also said the idea of providing service through private contracts is not unprecedented. Several years ago, the FCC ruled that certain satellite transponders could be taken out of common carrier use and sold to individual users.

Also in 1987, the General Services Administration, which oversees government network services, asked the FCC to declare Federal Telecommunications System (FTS) 2000 as a non-common carrier service. The reported reason was that since AT&T was subject to tariff regulation, it wasn't clear that the carrier could guarantee fixed rates over the life of the contract, a major demand of the GSA.

The GSA told the FCC that FTS 2000 was a unique network arrangement designed to be offered exclusively to the government. The GSA also said that tariff protection was not warranted because the goverment is such a large user.

The FCC ultimately denied the GSA request because it wasn't clear exactly how AT&T's bid would be structured and it couldn't determine whether the bid would meet the criteria of non-common carrier service.

Innovation is the key

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Jim Kouzes, president of Learning Systems at the Tom Peters Group in Palo Alto, Calif., adds that companies focusing on innovation are preparing for the future.

"Automation simply means we will take what we already do and make it easier to do today," he said. "Innovation means we will change the way we do things for tomorrow."

Kouzes said the innovative firm will automate rote functions and add value to the operations.

Mark Brandstein, director of telecommunications research and consulting at The Yankee Group in Boston, said innovative companies take basic technologies and apply them to business functions in unique ways, giving those companies an edge in cost and customer service, as well as allowing them to bring products to market faster.

However, large companies typically find themselves at a disadvantage in developing innovation because of their sheer size and bureaucracy.

To offset that, some major users have undertaken organizational make-overs of their IS units in an effort to rekindle entrepreneurial spirit and drive innovation.

Sears, Roebuck and Co. last year farmed out systems development functions to the company's numerous business units and created Sears Technology Services, Inc. (STS) to manage the company's mammoth Systems Network Architecture network.

Through ongoing communication, STS educates IS personnel in the business units about its current and future network and processing capabilities, and works closely with them to plan new applications and ways to leverage the technology infrastructure for competitive advantage.

According to Gerard Weis, senior vice-president of STS, this arrangement has helped spawn a host of creative entrepreneurial applications that have dramatically improved customer service.

For example, Sears Merchandise Group is implementing a new application that will let retail personnel at its stores access inventory information from suppliers to determine whether a product is available and when it can be delivered. Clerks use a push-button phone to dial into a supplier's data base via the STS network, and a voice response system states when the goods can be delivered.

This not only provides better customer service but helps Sears stores reduce inventory levels, Weis said.

"Information technology departments have to become 'solutioneers,' " Pfendt said.

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Some users are even handing over data processing and network operations to vendors in order to focus on developing innovative applications.

Speaking at a recent conference, Henry Pfendt, Eastman Kodak Co.'s director of computing and telecommunications services, said one of the major reasons the company decided to farm out management of its network and data center operations was to focus on developing creative applications to serve business needs.

"Information technology departments have to become 'solutioneers' rather than gadget providers," Pfendt said. "We want vendors to manage network and information commodity services so we, who understand the business of Eastman Kodak, can provide the value-added information services that can give us a competitive edge."

Encouraging innovation

GTE Services Corp. in Stamford, Conn., has an extensive infrastructure designed to encourage innovation in its subsidiary companies. It includes brainstorming, an employee awards system and enticements for internal entrepreneurship.

Five years after holding a series of brainstorming seminars involving technologists and managers, GTE Data Services, Inc., one of the company's operations divisions, is still implementing some of the more than 300 innovative ideas generated ("Brainstorming may be way to get ahead," *NW,* Aug. 15, 1988). Shorter sessions held since then have fed into the pool of suggestions.

According to Nick Rackoff, director of information management strategic planning for GTE Data Services, brainstorming led directly to the creation of senior IS positions that ensure management support for technical innovations.

But it's a long step from esoteric idea to real-time innovation. Rackoff said GTE Data Services, like all GTE subsidiaries, uses an extensive system of cash and recognition awards to get employees to implement innovative ideas.

Also, GTE encourages systems units to experiment with new innovations, sponsoring "intrapreneurial" activity and rewarding groups or individuals for innovations in systems that improve the company's service.

"In drawing a link between brainstorming and innovation, I think intrapreneuring is the key," Rackoff said.

Use of ISDN meets expectations

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application. Although ANI reduced the average cost of handling calls by 3.6 cents, net savings must take into account the cost of ANI. AT&T charged 3 cents for each call delivered with ANI, a fee American Transtech considered high.

"We were as skeptical as anyone else in the industry when we heard it would be a 3-cent-a-call cost," Brown recalled. "We felt a little wary as to whether we'd be able to afford that with the large amounts of calls we have."

But the ISDN feature has proven its worth by improving turnaround time and customer service. "We really didn't know whether the benefits would warrant the cost, but we feel in the long run they have," Brown said.

Last January, AT&T reduced the cost of ANI from 3 cents to 2 cents. Users with more than 60,000 incoming ANI numbers per month will pay 1 cent for each call above the threshold ("AT&T to up PRI access, lower costs," *NW,* Nov. 20, 1989).

The company's production use of ANI and DNIS also validated labor saving projections from the trial. The ability to handle calls faster meant that increasing calling volumes could be handled with the same number of agents. In addition to lower long-distance charges, this led to a projected $230-per-week savings in an eight-agent environment.

"These savings are probably more fully realized as the size of the agent group increases," said Todd Stephenson, director of telecommunications and end-user services for the company.

Cost savings can be passed on to customers, making American Transtech more competitive, Brown said. "When we can lower our costs, it makes us a much more profitable company," she said. "It allows us to lower our costs to customers, which is going to bring in more business."

The agents' ability to handle a greater number of calls also made it possible to support more calls on existing trunks, Stephenson said. Although this benefit was not immediately beneficial to American Transtech, which uses three T-3s and 72 T-1s, it would enable smaller customers to significantly reduce the number of facilities they use, Brown said.

Stephenson said that ANI has also improved accuracy because agents no longer have to input telephone numbers, which they may have heard incorrectly or keyed in erroneously. Previously, that occurred 10% of the time, which slowed productivity.

Prototype of IBM tool trialed

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as a statement of direction last month and later indicated the products could ship as early as next month ("IBM VP outlines shipment plans for major OSI wares," *NW,* Feb. 12).

Merit is a consortium of Michigan universities, and NSFNET is run by a consortium of Merit, IBM, MCI Communications Corp. and the state of Michigan. NSFNET links more than 1,000 regional academic and research networks, and is one of the networks supported by the Internet, said Dale Johnson, manager of the network operations center of Merit/NSFNET.

Prototype

XGMON is the prototype for a net management product announced Feb. 15 as part of IBM's RISC System/6000 product family of workstations and servers.

The AIX Network Management/6000, which lets AIX systems send alerts to NetView using proprietary IBM formats, includes an SNMP manager application that lets RISC System/6000 machines manage TCP/IP networks using SNMP.

XGMON was developed specifically for NSFNET and has been used here since the NSFNET T-1 backbone was built in July 1988, said Nguyen Hien, manager of automation in IBM's Yorktown Heights, N.Y., Research Division.

XGMON, which is based on an IBM RT system workstation, is a management system that can support any device outfitted with an SNMP agent, which is SNMP server software that talks to XGMON's SNMP client software.

SNMP agents give a device the ability to generate SNMP alerts and respond to queries. For NSFNET, most of the SNMP agents reside in IBM RT-based packet switches and routers, Hien said.

The X in XGMON stands for the X/Window System interface used to let console operators display separate windows with different levels of detail, or open windows into other attached net management systems, Johnson said.

The G represents the gateways between the regional and backbone networks the system manages, and the MON stands for monitor, Hien said.

Configuration

XGMON is used to manage switching and routing equipment at the 16 NSFNET T-1 backbone nodes. In addition, it monitors some equipment on regional networks linked to the NSFNET backbone, including routers from cisco and Proteon, Johnson said.

Each backbone node is outfitted with several RTs attached to a 4M bit/sec IBM Token-Ring Network. The RTs run prototype IBM software that lets them function as routing control processors, high-speed packet switches and a device Hien called an exterior packet-switching processor, which provides the link to regional networks.

Each routing control processor has an SNMP agent that feeds net management data to XGMON and accepts queries from it, Hien said. Through the routing control processor, XGMON can control any remote device that supports SNMP using a combination of SNMP commands, including GET, Get-Next, SET, Get Response and TRAP.

GET and Get-Next are used to extract data from remote devices regarding predefined variables, such as error counts or whether interface links are up or down.

SET lets users establish variables and can also be used to cause actions, such as taking an interface down.

TRAPs send unsolicited data to XGMON to inform the console operator that something is wrong, such as when a link goes down.

Users can automate responses to traps with a tool dubbed G virtual machines, which are programs written in G, a language Hien said is similar to C.

"These G virtual machines can be written to wait for a TRAP and, on reception of the TRAP, trigger a series of SNMP commands or Unix programs" that attempt to remedy the problem or extract more information, he said. The G virtual machines are similar in function to NetView Command Lists (CList).

XGMON is structured with two separate components. One is an SNMP query engine, which is software that shuttles packets between agents, and the second component is an SNMP client, or manager software.

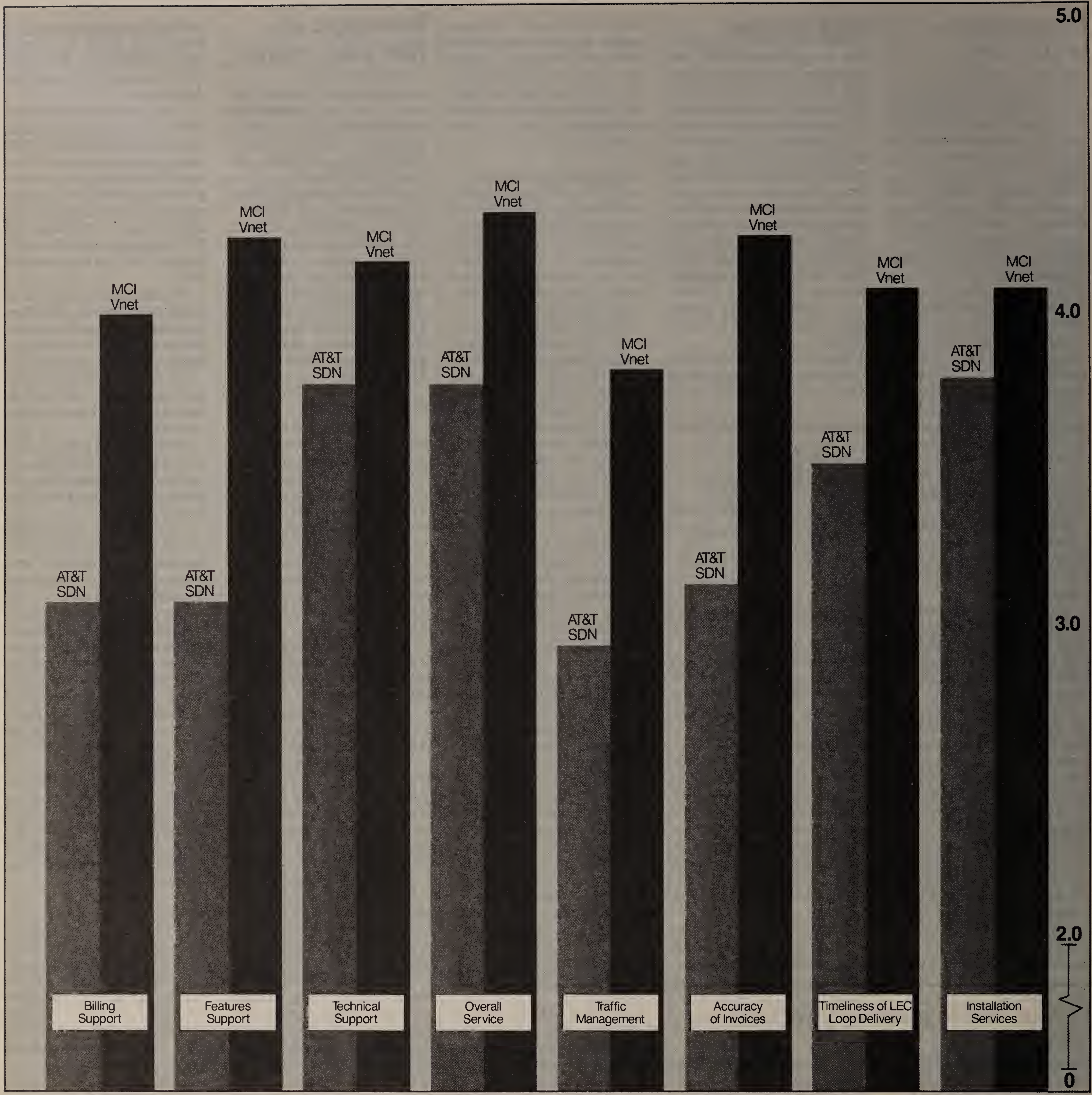
NetView

For the NetView application, which will be installed here shortly, SNMP query engine software will run under NetView on a VM or MVS mainframe, Hien said. That will enable NetView to accept SNMP data in native mode, as opposed to through some sort of gateway.

NetView will talk to the query agent as an SNMP client, and the query engine, in turn, will talk to the SNMP agents on the network using TCP/IP.

"The NetView operator could issue SNMP commands or write those commands in a CList to talk to SNMP agents over the network through the query engine," Hien said.

Hien could not say whether any products IBM announces in support of SNMP under NetView will be structured in the same way as the prototype. IBM has publicly announced only a statement of direction to support SNMP under NetView, though Ellen Hancock, vice-president and general manager of IBM's Communication Systems division, said it would be in a native mode.



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